NOV 23 1920

Volume 2, No. 11 NOVEMBER, 1920 OLD SERIES, Vol. XVIII, No. 11

The Journal of Orthopædic Surgery

The Official Publication of the
American Orthopedic Association
and of the
British Orthopædic Association

PUBLISHED ON THE FIFTH DAY OF EACH MONTH AT LINCOLN, NEBRASKA, U. S. A.
FOUR DOLLARS PER ANNUM
Entered as Second Class Matter in the Post Office at Lincoln, Nebraska

For the
British Orthopædic Association
Editor
R. C. ELMSLIE, M. S., F. R. C. S.
Editorial Committee
T. R. ARMOUR, F. R. C. S.
W. H. TRETHOWAN, F. R. C. S.
H. PLATT, M. S., F. R. C. S.

For the
American Orthopedic Association
Editor
H. WINNETT ORR, M. D., F. A. C. S.
Editorial Committee
JOHN L. PORTER, M. D., F. A. C. S.
F. J. GAENSLEN, B. Sc., F. A. C. S.
EDWIN W. RYERSON, M. D., F. A. C. S.

TABLE OF CONTENTS

OPERATIVE TREATMENT OF OLD HIP DISEASE. Mark H. Rogers and Chas. W. Peabody, Boston 589

BONE TUMORS. CENTRAL IN THE PHALANGES OF THE FINGERS AND TOES. CHONDROMA, MYXOMA. GIANT-CELL TUMOR. Joseph Colt Bloodgood, Baltimore 597

AMERICAN COLLEGE OF SURGEONS 616

EDITORIAL. READING THE BIBLIOGRAPHY 618

NEWS NOTES 620

ORTHOPAEDIC TITLES IN CURRENT LITERATURE 622

CURRENT ORTHOPAEDIC LITERATURE 627

ROBERT LINDER

Manufacturers of

Orthopedic Appliances

Hip Splints, Arm Splints, Knee Splints,
Bow-Leg Braces, Knock-Knee Braces,
Spine and Shoulder Braces,
and Flat-Foot Soles

ELASTIC STOCKINGS and TRUSSES
of every description

No. 148 East 53rd Street, New York

Vol. 2, No. 11 NOVEMBER, 1920 Old Series Vol. xviii, No. 11

The Journal of Orthopædic Surgery

OPERATIVE TREATMENT OF OLD HIP DISEASE

BY DR. MARK H. ROGERS AND DR. CHAS. W. PEABODY, BOSTON

At the Orthopedic Clinic of the Massachusetts General Hospital, on account of the fact that we have mostly adult cases, and because we take cases over 14 years of age which have been under treatment at the Children's Hospital, we have had a chance to treat certain cases of old hip-disease which still require further treatment on account of recurrences, persistence of symptoms and disability. In this paper we shall discuss the indications for operative treatment, the types of operations, and the results obtained.

Perhaps the type of case under discussion can be illustrated by the following case. A girl of 18 years had hip-disease at the age of 6 years and was under treatment for 4 years. For the last 6 years she has had a recurrence of symptoms, pain and disability, practically every year so that she would be required to stay in bed for two months, generally during the winter months. She called these attacks recurrence of the hip trouble and rest in bed and fixation would always relieve the symptoms. On examination she showed a deformity of 50 degrees flexion and 20 degrees abduction, with one inch actual shortening and a slight amount of motion in the hip-joint. During her younger years a month or two in bed was not considered such a hardship, but now it interferes with her earning capacity and the problem is to give her a stable hip.

We have tried to standardize the kind of treatment to be used in the different types of cases and we find that these cases practically fall into three groups.

The first group consists of those with practically an ankylosis, fibrous or bony, but firm, with deformity of the hip-joint, flexion

and abduction, and shortening. The second group consists of those cases with deformity and with definite motion in the hip joint. The motion may be very slight, and may be difficult to obtain on account of muscular spasm but when these cases are under ether, there is always more motion than suspected. The third group consists of those cases in which the head of the femur is destroyed and the trochanter rides up on the acetabulum. This is the more rare condition and a difficult one with which to deal. There is practically always motion as well as deformity, and great disability on account of instability.

The first group, those with ankylosis and deformity may be passed over with few words because the treatment of this group is practically standardized. These patients seek relief on account of the deformity and the pain and discomfort that arises from the strain due to the deformity. We feel that it is practically settled that some form of osteotomy near the trochanter and outside of the joint for the correction of the deformity gives good results, and this group will not be discussed further.

The second group, those cases which show deformity and motion, with a portion of the head left in the acetabulum, is the type with which we are chiefly concerned in this paper. In looking over our records we find that this condition occurs about as frequently as the first group, and that ankylosis is not necessarily the end-result of tuberculosis of the hip.

In analysing our cases, it is motion, the few degrees that are left, together with deformity that causes strain and tension on this motion, that is the chief cause of the so-called recurrence of symptoms. For this reason it is not wise to do an osteotomy and correct the deformity, because the deformity is too apt to recur, without there being solid ankylosis, and because it does not prevent the return of pain and muscular spasm. It is practically a rule not to do an osteotomy when there is motion.

The best result of tuberculosis of any joint is ankylosis in the position of choice for that joint and that position in the hip is 20-30 degrees flexion and 10 degrees abduction. It is true of the knee-joint and other joints, and probably this is the reason why fixation treatment and the use of plaster spicas is more used now than traction splints, because it tends to early ankylosis. We would much rather see a case with firm ankylosis than with a few degrees of motion, because there is less chance of so-called recurrence.

If there is evidence of motion in the hip-joint and deformity, the operative treatment consists of correcting this deformity within the hip-joint and at the same time making the hip solid, by doing an arthrodesis. The incision should be such that the joint is thoroughly exposed, and for this purpose we use the Smith-Petersen incision. An incision is made from the anterior superior spine down the thigh. The space between the tensor vagina femoris and the sartorius is located. This is the anterior approach to the hip-joint. Then the incision is carried along the crest of the ilium for three inches and all the muscles are separated from the ilium subperiosteally. This brings you directly over the acetabulum and the head of the femur and allows a complete view of the hip-joint. This is the incision we are using routinely. The hip joint is opened from the acetabulum down to the neck and the capsule pushed back from the head. Then enough of the head is removed to allow for the correction of the abduction and for the flexion deformity to be fully corrected. The acetabulum is cleaned out so that the head will fit securely into the acetabulum and two bony surfaces are in apposition.

We feel that a great deal of care should be used to remove enough bone from the head and from the acetabulum so that the hip is absolutely firm in its new position and that bony surfaces are in direct contact and that no large gap is left to be filled in by fibrous tissue. This type of operation is analogous to an excision of the knee where it is very necessary to have absolute apposition. In the hip it is very much easier to obtain good apposition and to hold it, because while the hip joint is thoroughly exposed, the limb can be brought into abduction and it can be seen whether the contact is perfect.

If necrotic material or even purulent material is found at operation, this is cleaned out, but no attempt is made to remove every bit of pathological material. It is impossible to remove all tubercular material and it is no more necessary than in excision of the knee, because the cure of the disease lies in obtaining an ankylosis. The wound is sewed up carefully, practically always without drainage.

The third group, consisting of those cases in which the head is absorbed and the trochanter rides up on the ilium, present an entirely different problem and is a much more difficult problem to meet. We see comparatively few of this group, at least where

there is absolutely no head and where the trochanter is extremely high. In certain cases it is not possible to say absolutely whether a case belongs to the second or third group, because sometimes there is only a little of the head left and the trochanter lies very close to the acetabulum. In these cases the operative technique is really a combination of the method just described and the method to be described for the third group.

In two of these cases where the trochanter rode high on the ilium, it was thought that the probably cause of pain was the impinging of the trochanter on the ilium. For this reason we removed the top of the trochanter, an extra-articular operation, taking away the impinging surface, but leaving the hip mobile, without making any difference in the symptoms. So we feel that this is not a very probable cause of the symptoms, but that the instability of the joint and motion that is always present in these cases is the real cause of the symptoms. As we study all these cases it becomes more evident that the motion in the joint is the real cause of the continuance of symptoms.

The principle of the operative treatment of this third group is to place the top of the trochanter into the acetabulum and try to make as stable a joint as possible. This can best be done by the same incision, for it is absolutely necessary to have a complete view of the acetabulum. The acetabulum is thoroughly cleaned out and it will be found to contain a good deal of detritus and fibrous material. Then the top of the trochanter is cut off, a sufficient amount being removed to get down to bone and also enough to enable you to place the trochanter into the acetabulum as the leg is brought into abduction. It must be very carefully fitted and must be solid or else there is a tendency for it to slip out, as happened in one of our cases, requiring a second operation. This makes a fairly stable joint with the limb in abduction.

Now as to our bad results, because by studying these cases the value of any operation or its faults can be ascertained by such a study. One case, a girl of 18, had multiple sinus tracks dissected out about 4 years ago and two years ago an arthrodesis was done on account of continued pain and disability. This is the only case out of a series of ten in which the sinuses redeveloped. She is now in the same condition as before, two discharging sinuses, slight motion in the hip joint and pain and disability. We believe that the mistake was made, not in operating, because

the patient was extremely handicapped, but because the operation of arthrodesis was not thorough enough. The head of the femur was not firm enough to expect that a firm union could be established and it would have been better to have placed the trochanter into the acetabulum. In this way we probably could have obtained a much more firm and stable joint, and this case will probably have to be re-operated.

A second case will probably have to have a second operation, because there is still motion in the joint and this motion is painful. It is quite evident that whenever the motion is entirely lost the symptoms disappear and we believe that this second case was not done thoroughly enough. We have noted that in two of the cases the fixation of the joint was delayed for over a year, but ultimately the results were good in that the patient could bear weight without pain and was able to walk.

The results of the second group of ten cases, arthrodesis of the hip joint, are two poor, two delayed union and six good. By a good result we mean that the patient is able to walk without pain and without evidence of recurrence of symptoms and that the hip-joint is solid, in a fairly good position and that the patient is satisfied with the result.

In conclusions the following points should be emphasized:

The best result in such a destructive process as tuberculosis is firm ankylosis, and in order to prevent the recurrence of symptoms in adult life, this should be the aim of treatment.

The correction of deformity by means of osteotomy below the joint should not be done in cases where there is an unstable joint on account of recurrence of the deformity and on account of continued symptoms.

When there is motion in the joint, which is evidently the cause of symptoms, the deformity should be corrected within the hip joint and arthrodesis performed for stability of the joint.

Discussion

Dr. Truslow: As I take it, the object of this paper is discussion of that extremely trying condition, recurrence of tubercular hip joint disease. It recurs over and over again. These are very difficult cases. Personally, I feel that in the third group, where there is large destruction of tissue, and the bone which is left is high up on the ilium, the proceedure outlined seems to be the one to undertake. I wish the speaker had said more of the first group,—ankylosis with a number of degrees of deformity. In the second series, a degree of

motion with flexion deformity, it has been my custom to give a long term of fixation with a plaster spica and attempt to correct the deformity a little more, as I believe one can, getting it toward the first position, that is ankylosis, and then decide whether one can get back mobility. I believe that in selected cases one can get back some motion. I don't agree that ankylosis is an end result to look for. I have got excellent results in two cases in which by the history and X-Ray plates the diseases was evidently stopped. I freed the head from the acetabulum, then took a sufficient amount of fascia lata, covering over the head with purse string suturing and thus getting a remarkable degree of motion. I must speak against considering bony ankylosis as a desirable end.

DR. OSGOOD: I believe that Dr. Truslow may be right when he says that we must look for motion in the diseased hip. We think of tuberculosis as a disease in which we may well consider the classical lines of treatment as established but perhaps we shall still get back to the idea of some voluntary motion in the hip joint, without weight bearing as favorable to the cure of the disease. We are now learning how much the lymph and blood supply to joints is favored by voluntary motion. The amount of eventual motion, if any, will be small where the disease is of long duration and it usually means a constantly painful hip. With the changed and partially destroyed weightbearing surfaces, to hope for useful motion is more or less like the purification of politics, an iridescent dream. Dr. Truslow spoke of the disease being over: I have never yet met anyone who could tell me when tuberculosis was over. I have operated on an elbow joint and gotten a good immediate result from the arthroplasty. Later the patient developed tuberculosis in the elbow joint. The patient had had tuberculosis of the elbow as a child, twenty-eight years before, but the history was not accurately obtained and it had been unsuspected. We must not forget Dr. Painter's paper on the malignancy of bone and joint tuberculosis. Patients should never be told that the danger from the disease is entirely over. I think Dr. Rogers' study is extremely instructive. The Smith-Peters incision is a lasting contribution to surgery of the hip-joint, but one is not obliged to employ it in all hip-joint operations. It is of advantage where you need a large exposure especially of the acetabulum.

DR. FREIBERG: I feel that I would rather have a mobile hip joint for my own case, if I could control the motion. The X-Ray shows us why the mobile joint was not feasible. The muscular apparatus has been damaged during the years when the hip was a useless proposition and this interferes with placing the hip in the proper position. Operation by the Smith-Peters incision is admirable but it is a considerable operation. Abduction is not obtained unless there is a tenotomy of the adductors to make abduction possible. One could get a more satisfactory position of abduction in this way.

DR. BRACKETT: "One of the important features to be decided in this operation is the angle of ankylosis to be given to the patient. In my opinion, as a rule, we give too little flexion and too much abduction, forgetting that patients are obliged to both walk and sit, and a compromise position between the best walking and the best sitting position gives the ideal angle. To condemn a person who has a sitting occupation with an ankylosed hip to the position of nearly full extension is unfortunate. On the other hand, it is easy for an individual to walk with a very considerable degree of flexion; in fact, a considerable degree of flexion gives an easier gait than a position of full extension. The position of equinus of the foot used in walking, overcomes the added shortening from the flexion and also gives an elasticity of the gait; at the same time it allows the patient to sit in a much more comfortable position, and to go into public places with much greater ease than with the leg which is constantly projecting forward and in the way.

The rule of giving abduction which applies to children does not have the same force, when applied to adults. It is always to be expected that a decided amount of abduction disappears in the growing period of children, and, there-

fore, the abduction obtained by the operation does not, as a rule, entirely persist. On the other hand, abduction in an adult with a less flexible spine, throws the base of weight bearing so far laterally from the line of gravity that the gait is both awkward and difficult. The small amount of lengthening obtained by this does not compensate for the difficulty and awkwardness of gait.

DR. SOUTTER: In a subtrochanteric osteotomy for the correction of hip deformity it is very hard to overcome all of the flexion. If all of the flexion is to be overcome the post-operative position should be that of hyperextension. It is also difficult to get good abduction. If the ultimate position is to be a straight hip—that is to say, a neutral position as to abduction and adduction, the hip should be abducted about twenty degrees. In other words the abduction should always be from 15 to 20 degrees more at the time of operation than what the surgeon wishes the ultimate abduction to be.

As the case progresses, flexion and adduction are always increased and are usually more than we wish. The best ultimate position in the average case is 25 degrees of abduction and about 10 to 15 degrees of flexion. This gives the necessary length. When the hip is not entirely stiff but the motion is limited, this position will be the most satisfactory one in every way. In a woman with very large hips an ultimate position of about 15 degrees of abduction is sufficient and a pad is worn over the hip to make the clothes look symmetrical.

DR. RYERSON: It seems to me that this is a very important subject and there are several points that we ought to settle. I have realized that the old teaching of the masters that abduction is desirable is not the best teaching. It is good for children, but as they get older they complain of the abducted position. The point of giving more flexion is also important. The other point is that we should not do arthroplasty in old tubercular hips. It is flying in the face of Providence. I took three or four cases who had shown no evidences of activity for years, and did arthroplasties, and they developed dangerous tuberculosis in the hip joint. I found caseous masses which had persisted for ten years without symptoms. No man can say when the tubercle bacilli disappear. Don't let us advocate making mobile hips out of old tuberculous joints. The sooner we make these joints stiff and leave them stiff, the better.

DR. L. T. BROWN: I would like to add my word to that of Dr. Brackett. A recent patient with a tubercular spine, who had had a bone graft, also had an arthrodesis of the hip. The hip was in a position of 50° flexion and some 5° adduction. The patient said he preferred this position of adduction, and for his work, which was largely sitting, the 50° of flexion was an advantage. The opinion of this patient and of others that I have talked to make me feel that a straight position or even a few degrees of adduction is functionally preferable to an abducted position, although theoretically the position of abduction would seem to be preferable.

DR. RUGH: I think that one conclusion drawn by Dr. Rogers, in the early part of his paper, was wrong: namely, that ankylosis was likely to occur in fixation of the hip. That is true if you have an inflammatory reaction in the tissue, but you must remember that the best offset to the inflammation is absolute rest and fixation. When you fix the hip you limit the inflammation and preserve the function of the hip joint. Fixation prevents ankylosis. As much motion as can be secured is desirable, provided the process is quiescent. In the vast majority of cases the trouble is not due to relighting of the tubercular condition but to strain on the parts immediately about the joint. Strain in the pelvis and tissues of the insufficiently ankylosed hip joint causes pain and disability, and restoration of the balance will in many cases relieve the strain. One can never say when a case of bone tuberculosis is cured. I have had one case break out after sixty years of quiescence.

DR. FREIBERG: I want to say that I think these persons are better off with some degree of flexion. I have not seen cases with completely extended hip. I think there should be some degree of abduction, although you don't want the hip to stick out at a right angle.

DR. ROGERS (closing): Dr. Truslow spoke of the further treatment of these cases by conservative methods; but if the cases have to be treated by traction and fixation you have the same condition. I think it is time to fix the cases permanently. In regard to not being able to get abduction by operating in the hip joint, I believe that with a free operation in the hip joint you can get any position you want.

BONE TUMORS. CENTRAL IN THE PHALANGES OF THE FINGERS AND TOES. CHONDROMA. MYXOMA. GIANT-CELL TUMOR.

BY JOSEPH COLT BLOODGOOD, BALTIMORE

A rare specimen of a central chondroma of the phalanx recently sent me by my colleague Dr. William A. Fisher of Baltimore, has stimulated me to review 8 cases—6 involving the phalanges of fingers and 2 of the toes. Those involving the fingers were myxoma or chondroma, of those of the toes one was a chondroma and one a giant-cell tumor.

I have had no other histological types of tumors in the central portion of the phalanx. A benign bone cyst lined by ostitis-fibrosa tissue has been observed in the metacarpal and metatarsal bones, but not in the phalanges. Recently I have received an X-ray film which suggests a central ostitis fibrosa or bone cyst (Pathol. No. 25646½) multiple in the phalanges of the thumb and index fingers, but the X-ray and clinical diagnosis in this case have as yet not been confirmed.

Case I. *Pathol No. 26259. Central chondroma involving the first (proximal) phalanx of the little finger; removed by amputation in June 1920.*

The specimen was sent to me by Dr. Fisher. Fig. Ia is the X-ray of the specimen sent to the laboratory. The entire phalanx is involved, but the joints seem free. At every point, except one, the bone shell is preserved; at this one point there is perforation.

The Roentgenologist before operation, expressed the opinion that, because of the perforation, one should be suspicious of sarcoma.

I will refer later to the fact that perforation of the bone shell in central tumors is not, of itself, of diagnostic significance, because it has been observed in the bone cyst, in the giant-cell tumor, in the pure myoxma, and now in this case in the chondroma.

The X-ray in this case, as compared with our other central tumors of the phalanx shows, on the whole, less expansion of the bone shell, in view of the total involvement of the phalanx, and a much more mottled shadow. The perforation is distinct with evidence of a small periosteal growth without a bone shell.

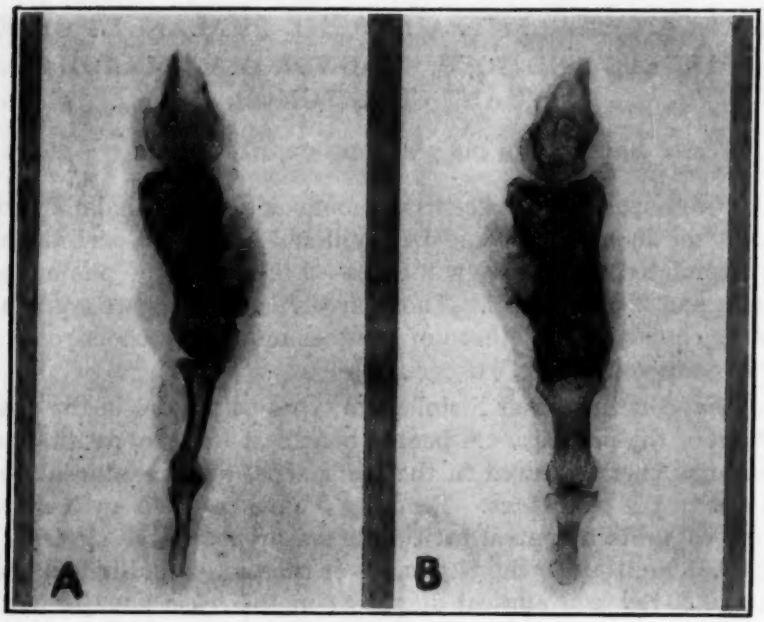

FIG. 1.

Case I. *Pathol. No. 26259.* Central chondroma of phalanx showing perforation at one point. *a*—lateral view; *b*—antero posterior view.

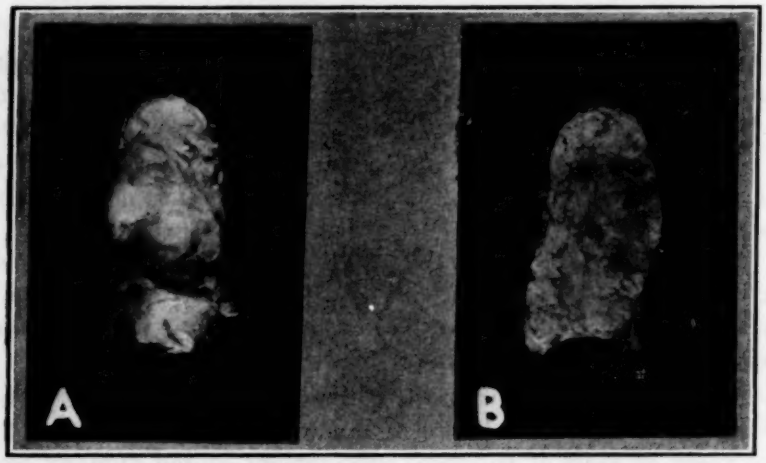

FIG. 2.

Case I. *Pathol. No. 26259.* Photograph of specimen; *a*—capsule, *b*—cut surface of the cartilaginous tumor involving the entire phalanx shown in Fig. 1

Fig. 2a and b is a photograph of the dissected specimen: *a* the outer surface, and *b* the cut surface. The bone shell is very thin; the mottled appearance of the X-ray shadow can be explained by fine bone lamellae running through the solid cartilage tumor. I dissected this specimen myself and I found that, although the bone shell was perforated at one point, the periosteum was intact, and this phalanx could have been dissected saving the tendons, but not their sheaths.

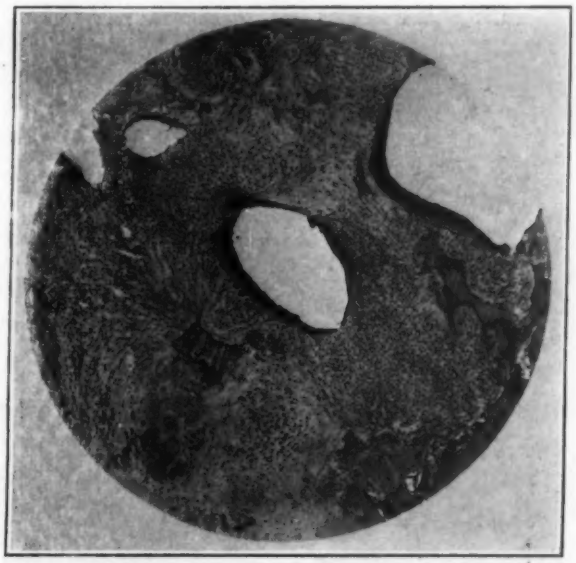

FIG. 3.

Case I. *Pathol. No. 26259.* Microscopic picture (low power) showing cartilage, bone lamellae and minute cysts.

The microscopic sections (Figs. 3 and 4) demonstrate that we are dealing with a tumor composed entirely of cartilage in various stages of development, and the cartilage areas are separated by bone lamellae. There are no giant-cell areas and no myxomatous tissue. It is my opinion that in this case the finger could have been saved by removal of the entire phalanx as Codman did in 1901 (Figs. 9, 10 and 11).

The functional result obtained by Codman should be constantly borne in mind, because when the lesion involves a phalanx of

a finger, other than the little finger, Codman's method of resection would yield a better functional result than amputation, or the function might be improved by resection and bone transplantation. Up to the present time I have no definite case of the latter.

Clinical Note. Dr. Fisher writes that the patient was a white female aged seventy-five. The duration of the symptoms is not given. First she observed a pimple which she pricked with a needle. Then her physician incised the pimple, but found no pus. The wound healed, but this portion of the finger remained painful

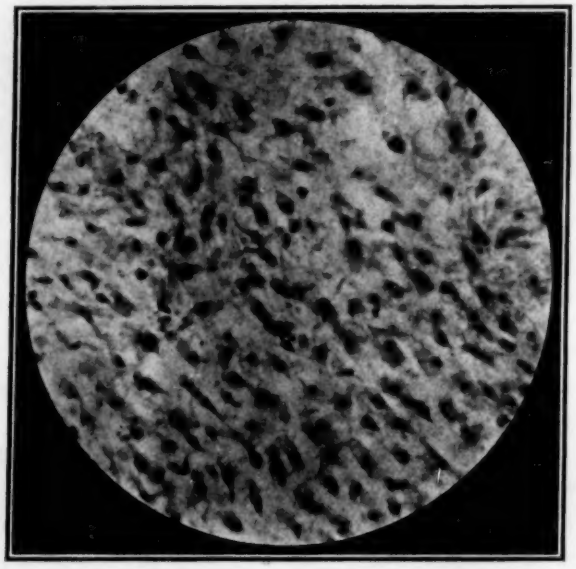

FIG. 4.

Case I. *Pathol. No. 26259.* High-power microscopic picture, showing young cartilage with some *stellate cells*, areas difficult to differentiate from myxoma.

and tender, and the patient has been unable to completely flex or extend it. For this reason an X-ray was taken and the tumor found. The probabilities are that the pimple pricked and incised had no relation to the bone lesion.

Case II. *Pathol No. 25254. Central chondroma of first phalanx of third left toe.*

Fig. 5 is an X-ray showing the small lesion of the middle of the shaft of this phalanx—an entirely different picture from Fig.

1. The patient, in this case, a white male aged twenty-one, was unaware of any trouble with his toe until he stubbed it two weeks before operation. The X-ray was taken because of pain and tenderness. There was a pathological fracture, but incomplete. Dr. Kilgore in amputating this toe at the U. S. Naval Hospital at Chelsea, Mass., in July 1918, broke the bone completely at the position of the tumor. Dr. Goodpasture, the pathologist, writes me that the sections showed cartilage. The present result has not been ascertained.

That a pathological fracture was the symptom of onset in the second case is easily explained by the position of the tumor.

These two cases establish the fact that a chondroma may be the cause of a central tumor of a phalanx of either finger or toe, and that even when small it may be the cause of a pathological fracture. (Fig. 5 Case II), or, the cartilage tumor may completely invade the shaft without perforation into the joint (Fig. 1, Case I); that the perforation of the bone shell by this cartilaginous tumor is not a sign of malignancy. Bone lamellae separating the cartilage may be preserved as shown in Fig. 3 (Case I).

Central chondromas are not frequent tumors. I have but 7 cases: In 3 cases a phalanx was involved—2 fingers and 1 toe. The femur was involved in 3 cases. One case was multiple in femur and humerus.

The third case of central chondroma of a phalanx of a finger was recognized and curetted by Dr. Warrn L. Duffield of Brooklyn, N. Y. in January 1919. He writes me that from the X-ray picture it had been diagnosed cyst or sarcoma. The patient was a white female aged twenty-five years; there had been a swelling of the proximal phalanx of the left ring finger for one year. Dr. Duffield describes the operative findings as follows: "Bone entered and soft tissue resembling granulation tissue removed with the curette, leaving a very thin shell of healthy bone; joint not invaded; no chemical disinfectants, because the operator wished to place in a bone graft, which he did from the tibia; wound closed. The patient was followed for a few months without signs of recurrence."

Dr. Duffield also writes that one pathologist called it a fibrochondroma, another a myxochondroma. The section which Dr. Duffield was kind enough to send me shows a pure chondroma with

no evidence of myxoma. I have just restudied this section (August 1920).

In August 1919 Dr. Duffield writes me that he has lost track of this patient and that he has recently had a similar case treated in a like manner with the most satisfactory results. (Sept. 1920. Patient reports cured.)

I believe it is very important to bear in mind this central chondroma of the phalanx of the finger or toe, because undoubtedly curetting will give the best functional results. If the tumor has extended beyond this as in Case I (Fig. 1) one may resect after

FIG. 5.

Case II. *Pathol. No. 25254.* Central chondroma of phalanx of toe. Kilgore's case. Pathological fracture, no displacement.

FIG. 6.

Case III. *Pathol. No. 8630.* Central myxoma of phalanx. (Baer's case, X-ray by Baetjer).

the manner of Codman, or place a transplant into the defect. Amputation is not indicated. The following of Duffield's two cases of curetting for central chondroma of the phalanx will be of great interest to confirm this statement.

I have, however, a record of a central chondroma involving both condyles of the femur in a woman aged fifty-one. The tumor was found accidentally in an X-ray examination as the patient was

admitted to a hospital complaining of arthritis. She refused the amputation suggested at that hospital. Some time in August 1916 the tumor was explored at the Mayo Clinic, a piece taken out and diagnosed chondroma, and radium introduced. Later there was a second curetting and radium treatment. This patient was well in August 1919 three years later. Dr. Broders was kind enough to send me a section, and it shows nothing but cartilage. As far as I know this is the greatest test of curetting for chondroma. I am attempting to get an X-ray of the present result. It is possible that cartillage still remains in a quiescent state. Practically, however, the patient is well with good function and no pain.

Dr. John Douglas of New York (Annals of Surgery, 1919, lxix p. 336) reports briefly before the New York Surgical Association a central chondroma of the fibula. The X-ray was diagnosed as bone cyst above the malleolus. The patient was a female aged thirty and had observed the swelling one year. At the operation it was necessary to open the bone with a chisel; the cavity was filled with a firm gelatinous mass. The frozen section showed a cartilage tumor. The cavity was then filled with a bone graft from the tibia. For six months serial X-rays showed apparent perfect healing.

On the other hand, the central chondroma may produce huge tumors. The largest bone tumor in my series was a central chondroma of the shaft of the femur observed in the Johns Hopkins Clinic in 1897. The tumor contained many cysts.

The example of multiple chondroma of the femur and humerus demonstrates that operation is not always indicated. This boy, aged nine years, was observed in the Johns Hopkins Clinic in 1912. The pathological fracture through the shadow suggesting a central chondroma of the lower end of the femur healed, and there has been no fracture or other change for seven years. The swelling of the upper end of the humerus showing a similar picture in the X-ray was explored and curetted. The sections show chondroma, no myxoma.

Le Conte's case of central chondroma of the femur which was studied pathologically by Longcope and Lee of the Pennsylvania Hospital of Philadelphia and which I mentioned in 1910 (Annals of Surgery, 1910, lii, 159) recurred, was finally amputated, and died of secondary hemorrhage. I have been unable up to the

present time to get the complete data. Apparently there is no question that it was a central chondroma and that it recurred. (This case is to be reported by Dr. Lee.)

A similar recurrence has been recently brought to my attention by Codman of Boston, who has sent me the specimen. In this case there was a number of operations for a recurrent chondroma of the humerus, finally leading to a shoulder-girdle amputation because of recurrence in the region of the shoulder-joint.

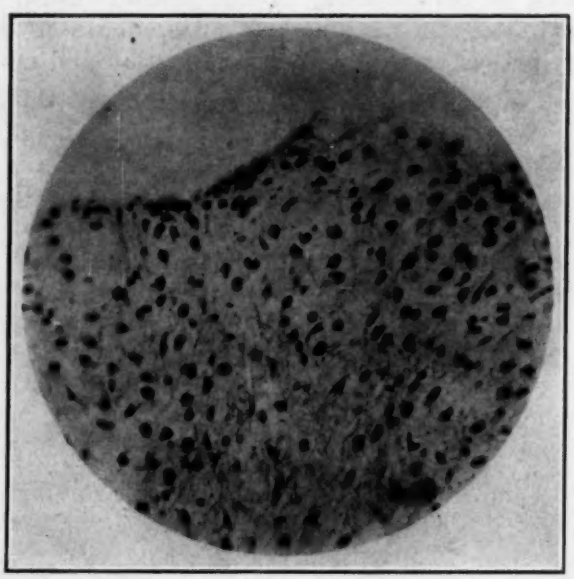

FIG. 7.

Pathol. No. 6773. Photomicograph (high power) of pure myxoma, in this case a periosteal tumor of the humerus.

I have just studied the sections from the last recurrent tumors —they are pure chondromas.

Dr. De Witt Stetten (Annals of Surgery, 1920, lxxi, 200) reported before the New York Surgical Society a recurrent central chondroma of the femur.

Recurrences, therefore, may take place in chondroma in which the sections show no myxoma and no sarcoma (cases of Le Conte, Stetten and Codman). I have observed a recurrent periosteal chondroma of the metacarpal bone which has now remained well six years after the second operation. At this operation I removed

the recurrent periosteal tumor with the cautery and preserved the bone.

When I am able to complete the study of Codman's and Le Conte's cases, I hope to make a further report on chondroma, but—to repeat the results in Duffield's two cases of curetting for central chondroma of a phalanx of the fingers will be of great interest.

Although radium seemed to have a favorable influence on the central chondroma of the lower end of the femur curetted twice in the May Clinic, in a recent observation of my own of a recurrent chondroma of the knee-joint radium had no effect. In this case the original cartilage tumor was removed by Dr. Hoke of Atlanta, and the sections were sent to me for microscopic study.

The evidence, therefore, so far demonstrates that we cannot always depend on radium for the cure of chondroma.

Central Myxoma of the Phalanx

While we have noted 3 central chondromas (2 of the fingers, 1 of the toe) we have but 2 cases of proved central myxoma, both of the fingers. In one (Pathol. No. 8630, Case III) my colleague Dr. Baer curetted in 1907, but we have been unable to follow this case. In the second case (Case IV, Pathol. No. 15597) Dr. Rhodes amputated at the metacarpo-phalangeal joint in 1914 and reported the patient well in 1916. The result, therefore, in the most important case is stll doubtful.

Case III. *Pothol. No. 8630.* Central myxoma of proximal phalanx of little finger. Fig. 6 is an X-ray by Dr. Baetjer sent me by Dr. Baer. It shows a light shadow in the proximal end of the proximal phalanx. The epiphysis is not involved. The bone shell is perfectly preserved. It has no distinct markings as in Fig. 1, central chondroma of the finger phalanx, but it is not unlike Fig. 5 the small central chondroma of the phalanx of the toe. In this case the patient was a white female aged twenty-two years; she had observed a swelling for five years; there was no history of trauma. Dr. Baer curetted. It is very interesting to note that on cutting down upon the bone shell he found a pin-point opening from which there exuded gelatinous material (I have discussed perforation of the bone shell in Case I Fig. 1). On incising the periosteum he found a thin bone shell in places completely destroyed. The cavity was filled with gelatinous material. The

line of demarkation between the tumor proper and the bone marrow on the distal and proximal ends was not sharp as one would have expected from the X-ray picture. It is also important to note that the cavity after thorough curetting was swabbed with pure carbolic and the wound closed.

FIG. 8.

Case III. *Pathol. No. 8360.* X-ray six months after operation (See Fig. 6). The central myxoma of the proximal phalanx of the little finger was curetted. The lesion hardly shows in the X-ray reproduced here.

FIG. 9.

Case V. *Pathol. No. 6892.* Central myxoma (?) of middle phalanx of middle finger (Codman's case). Resection in 1901. Followed three years, no recurrence. For result see Figs. 10 and 11.

I saw the tissue in the fresh. It was gelatinous, mucoid, friable, not unlike tapioca. The frozen as well as the most carefully fixed sections showed a pure myxoma similar to Pathol. No. 6773, a previous case of pure myxoma of the humerus (Fig. 7). Unfortunately this section has been lost and cannot be restudied. I feel, however, confident that the diagnosis of myxoma was correct.

The X-ray taken six months after operation strongly suggested almost complete ossification. Fig. 8.

Case IV. *Pathol. No. 15597.* The section in this case was sent to me by Dr. Rhodes from the Jefferson Hospital in Roanoke, Va. The patient was a white male aged sixty-two; the swelling of the right ring finger had been present for twenty years following an injury. The X-ray was diagnosed a bone cyst. The operation consisted of amputation. Dr. Rhodes sent these sections with the statement that they had been diagnosed "cystic, with beginning sarcomatous changes." My notes in 1904 on the microscopic section is as follows: "There are lamellae of bone in the mesh-work of which tissue resembling ostitis fibrosa is seen. This apparently represents the bone capsule. Within this the tumor is a pure myxoma." (See Fig. 7.)

In addition to these 2 cases which we have every reason to believe are pure myxomas, there are 2 other cases: Codman's case (Case V, Pathol. No. 6892) and Dr. George's case (Case VI, Pathol. No. 12206).

Case V. *Pathol. No. 6892.* Central myxoma (?) of second phalanx of ring finger.

As far as I know, this is the first case in our own literature, but its chief interest is the excellent functional result after the excision of this middle phalanx. Fig. 9, the X-ray sent me by Dr. Codman, shows that the entire phalanx is involved, similar to Case I, but the bone shell is more distinct than in Case I. When compared with Case III (Fig. 6) the X-ray in Codman's case is much more mottled. I think one can conclude from these four X-rays that there is no way of making a diagnosis between myxoma, chondroma and a cyst from the X-ray plate only.

Figs. 10 and 11 are reproduced from Codman's original article (Boston Med. and Surg. Jour., 1904, cl. 211). One shows the X-ray after operation, and the other the strength and function of the

finger. This patient was a white female aged forty, and the swelling of the phalanx had been present for more than a year. After removing this phalanx without cutting into it, Dr. Codman found a shell of bone containing a cavity filled with a straw-colored serous fluid and lined by a soft translucent myxomatous membrane. This is rather the gross picture of a cyst, except the lining connective tissue is not soft, but leathery in the cyst. Muller has reported

FIG. 10.

Case V. *Pathol. No. 6892.* X-ray result in Codman's case (see Fig. 9).

FIG. 11.

Case V. *Pathol. No. 6892.* Functional result in Codman's case (see Figs. 9 and 10).

such a cyst in a metacarpal. Dr. Whitney, the pathologist in Dr. Codman's case, described it as a myxochondroma, but the sections were lost.

Case VI. *Pathol. No. 12206.* Fig. 12 is an X-ray sent me by Dr. W. George of Boston. The markings are not unlike Codman's case (Fig. 9) and it resembles Baer's case in that only one-half of the phalanx is involved, while in Baer's case the shadow is round, in George's case it is somewhat square.

Again we have evidence that the same tumor in the same bone may produce pictures which differ in some respects. One would

rather expect that the myxoma or the chondroma in a phalanx would grow somewhat uniformly, but up to the present time such uniformity has been absent in all the bones of the skeleton.

Dr. George wrote me that the patient was a white female, aged thirty, and that the swelling had been observed two years. At that time (1911) I suggested exploration and curetting to be followed by pure carbolic acid and alcohol, or, I added in my letter; "if it is giving her no trouble, leave it alone." I warned Dr. George of the danger of curetting a myxoma without such chemical destruction. I was of the opinion then that a differential diagnosis could not be made from the X-ray.

In my contribution on bone cysts (Annals of Surgery, August 1910 vol. lii, 150) I collected at that time 5 examples of central lesions of the phalanx which I thought were myxomas, because I

FIG. 12.

Case VI. *Pathol. No. 12206*... X-ray sent by Dr. George of Boston. Not report on operation.

FIG. 13.

Case VII. *Pathol. No. 17536*. Central giant-cell tumor of end phalanx of toe. Specimen sent by Dr. McGill.

had examined histologically Baer's case. At that time Dreesman and Blake had curetted, as was done by Baer, but in these 3 cases as well as in the 2 cases curetted later by Duffield for central chondroma, we have not the results to justify the belief that curetting will effect a cure.

Central Giant-Cell Tumor of End Phalanx of Toe

Case VII. *Pathol. No. 17536.* The specimen shown in Fig. 13 was kindly sent me by Dr. McGill of Butte, Montana. A longitudinal section has been made through the toe and phalanges. The marrow of the end phalanx has been practically replaced by a reddish tumor, but one can feel, although not see, that spicules of bone are present throughout the tumor. The patient was a white male aged eight years; pain and swelling had been present four months. No X-ray was sent me. It was the first giant-cell tumor of a phalanx that I have observed. In the upper extremity we have one giant-cell tumor of a metacarpal bone; in the lower extremity the giant-cell tumors have been observed in the astragalus, os calcis (2) and in the phalanx in this case.

These tumors are therefore comparatively rare. Fig. 14 is a low-power photomicrograph of the entire tumor, except a portion of its capsule. This picture shows chiefly the presence of bone in islands throughout the tumor and that the bone shell is not continuous, but here and there destroyed. Microscopically, I was unable to demonstrate giant cells outside the bone capsule. (Fig. 15).

The tumor, when studied with the high power seems to belong to the giant-cell tumor of the epulis type (Fig. 16).

Although the giant-cell tumor involved the phalanx beneath the nail, it is not the subungual perithelioma observed by Muller and previously reported by me (Progressive Medicine, Dec. 1906, p. 267), because this tumor never attacks bone and is of different histological appearance. One interested in soft-part finger tumors is referred to my review of this subject and the literature in Progressive Medicine (Ibid. p. 262). None of the authors then reviewed had observed a medullary sarcoma of a phalanx, and Heineke was the only one who had noted a cyst in a phalanx, and in his case it was situated in the great toe of a patient with multiple bone cysts of the skeleton.

It is also worthy to note that in my own list there is not an example of a malignant periosteal sarcoma of a phalanx, and there has only been one case of one in the metatarsal.

It is very interesting to compare this absence of malignancy in periosteal and central tumors of the phalanges with a similar finding in the so-called fibroma of the tendon-sheath. This tumor is really a granulation-tissue tumor and often of the xanthoma type. Attention has been frequently called in the literature to the fact that it is practically never malignant when situated on the fingers or toes, but when situated on the tendon-sheaths of the hand or

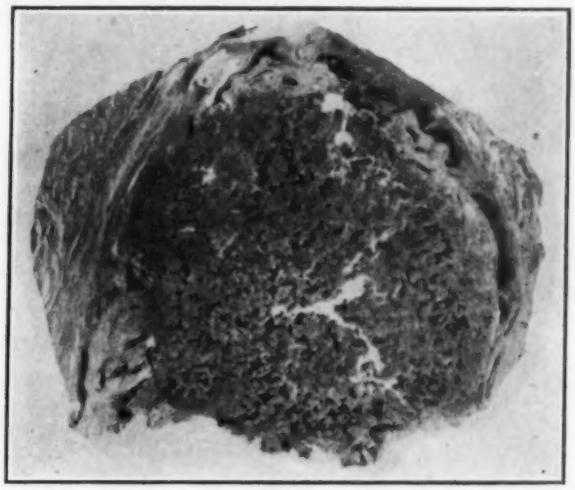

FIG. 14.

Case VII. *Pathol. No. 17536.* Photomicrograph (low power) shows the islands of bone and the broken bone shell in a giant-cell tumor (See Fig. 13).

foot, it has been observed to be malignant in a few cases, and when situated above the ankle or wrist it is more apt to be malignant than benign. This fact so frequently quoted in the literature, is confirmed by the cases observed in the Surgical Pathological Laboratory of the Johns Hopkins Hospital.

Supplementary Remarks. For the past year I have been concentrating on the study of bone tumors, and in the past two weeks I have gone over again and again the sections of all the bone tumors diagnosed chondroma, myxoma, chondromyxoma and myxo- and chondrosarcoma. Apparently three groups are not difficult to

recognize with the microscope—the pure chondroma (Fig. 3), the pure myxoma (Fig. 7) and the sarcoma, whether it is associated with cartilage or myxoma. But it is very difficult to distinguish certain areas in the chondroma in which the cartilage cell is not definitely situated in its little lacuna and become permanently imbedded in the intercellular chondrine, because, mixed with the youg round cartilage cells, there may be a stellate cell not unlike that in the pure myxoma. (Compare Fig. 4 with Fig. 7).

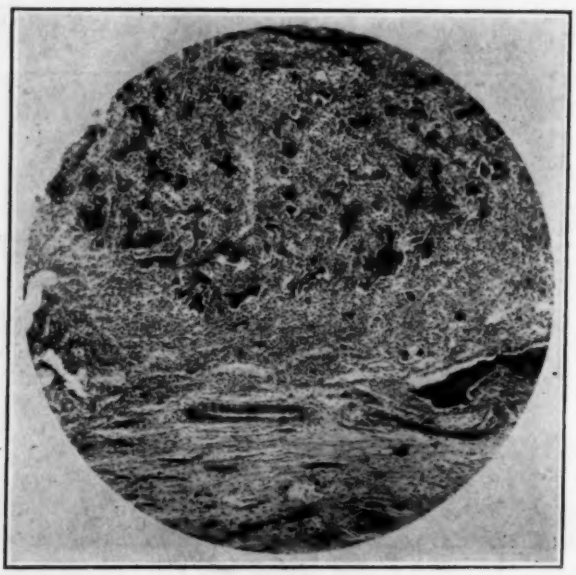

FIG. 15.

Case. VII. *Pathol. No. 17536.* Photomicrograph (low power) shows the uninvolved capsule with some remains of the bone shell, the giant-cells and small islands of bone in the tumor.

Our restudy has been complicated by the fact that myxomatous tumors preserved in formaline or alcohol when reblocked and cut have practically lost their intercellular substance and fail to show the typical pictures after five years. So many of our best specimens could not be restudied. Fortunately the case in Fig. 7 had been photographed. But even the section from which the photograph was made has faded. This is not so with the typical areas in the cartilage tumors, but with the softer portions of the cartilage tumors composed of young cartilage with many stellate cells, the

same destructive process is observed in the gross specimen and in the old section. I am therefore skeptical of the correctness of our diagnosis of some cases of chondroma. That is, some of our cases called chondroma may contain myxomatous tissue.

These cases of chondroma and myxoma have not come in frequently enough, and we have not always been able to obtain the fresh tissue for frozen sections. There is an opportunity for a reinvestigation of the best differential stains for frozen sections and best method of fixation for permanent sections.

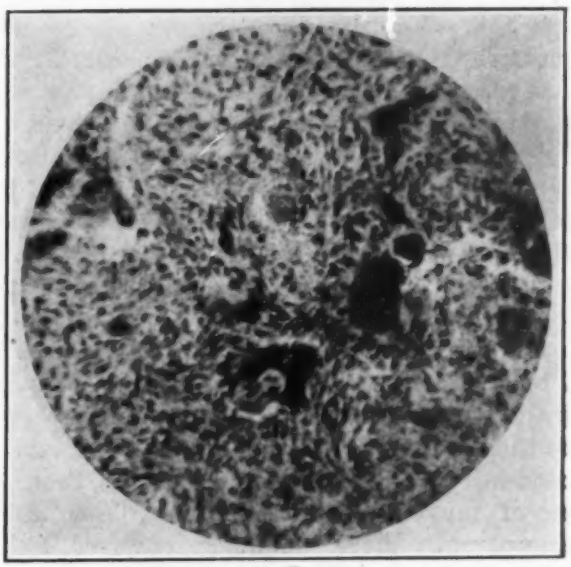

FIG. 16.

Case VII. *Pathol. No. 17536.* Photomicrograph (high power) showing the giant cells and the rather typical granulation-tissue-like matrix in which the giant cells are imbedded; also islands of bone.

I am of the opinion that it is of practical importance to differentiate chondroma from myxoma. The myxoma seems to demand more radical treatment.

In my own practice I, however, propose to treat myxoma and chondroma alike, until I am certain that we can differentiate one from the other. I am not quite sure that Case I (Fig. 1) does not contain some myxomatous tissue.

The study of the myxomas will shortly be published in the Annals of Surgery.

A central chondroma of the lower end of the femur (Journal of Radiology, March 1920, i, 180 Fig. 15, Pathol. No. 22016) which had been subjected twice to curetting followed by radium, is well (August 1920) with good function three years after the last treatment. In restudying the sections from this case it appears to be a pure chondroma with no areas of young cartilage and no stellate cells, but the sections are poor, so that we cannot be absolutely certain.

A second case of apparently pure chondroma involving the knee-joint mentioned in the same article (p. 208, Fig. 85, Pathol. No.24367) has recurred. In this case the tumor was removed from the knee-joint by enucleation in April 1919. There was definite evidence of recurrence some time in July 1920, after the manuscript of my article in the Journal of Radiology had been sent to the publishers. Most thorough radium treatment had no effect. Two days ago I was compelled to amputate the thigh, because the recurrent tumor involved the knee-joint so extensively that removal with preservation of function was out of the question, and then I feared recurrence from transplantation even if a conservative operation had been possible. With the help of Dr. Terry, Professor of Pathology in Vanderbilt School of Medicine, we were able to make a most thorough frozen-section study. The tumor resembles that illustrated in Figs. 3 and 4 (Case I), that is, there was no positive evidence of myxomatous tissue. Yet, how differently this chondroma, apparently more completely removed, has behaved as compared with the one in the lower end of the femur which was only curetted and treated with radium.

Again, in the Journal of Radiology (pp. 190 and 191, Fig. 56, Pathol. No. 10150) I describe an exostosis of the lower end of the femur which was removed piecemeal. The tumor was apparently composed chiefly of bone. When this patient died four years later of recurrence, I found on re-examination of the sections, areas of myxoma.

PREVIOUS COMMUNICATIONS BY THE AUTHOR

Annals of Surgery, August 1910: Bone Cysts, Ostitis Fibrosa, Giant-Cell tumors, Bone Aneurysm. 43 illustrations and literature.

Annals of Surgery, August 1912: Conservative Treatment of Giant-Cell Tumors; Bone Transplantation. Literature on Giant-cell Tumors.

Annals of Surgery, April 1919: Giant-cell Tumors. Destruction of Bone Shell or its Perforation Not a Sign of Malignancy. 25 illustrations.

Transactions of the Medical Association of the State of Alabama, April 1919: Brief review of benign and malignant bone cysts. 20 illustrations.

Journel of Radiology, Volume 1, March 1920, Pages 147 to 238, Figures 1 to 89; X-ray Diagnosis of Bone Tumors. 89 illustrations.

American Journal of Surgery, September 1920: Bone Tumors, Benign and Malignant. A brief summary of the salient features, based on a study of some 370 cases. 4 illustrations.

AMERICAN COLLEGE OF SURGEONS

The eighth annual congress of the American College of Surgeons convened October 10, 1920. The congress was entertained by the Canadians at Montreal. About 3,000 surgeons were present, and some 670 new members were initiated. It is interesting to note that 35 of these were from South America.

Among the notable foreign guests were Sir Berkeley Moynihan of Leeds, England; Sir William Taylor of Dublin, Ireland; Mr. A. Carless of Essex, England; and Sir Auckland Geddes, the British Ambassador.

The events of the congress may be classified under the following headings:

1. Introductory.
2. Clinics, scientific papers, and various exhibits.
3. Consideration of standardization work in hospitals, and other "things medical," by assembled committees.
4. Convocation of American College of Surgeons. Adjournment.

1. In the opening exercises, Sir Berkeley Moynihan presented, on behalf of the Royal College of Surgeons, a beautiful mace and with it their kindly greeting. The address was a masterly talk by a refined English medical man. It intensified the feeling of fellowship already existing, not only between Canada and the States, but between all American and Great Britain.

Dr. W. J. Mayo gave an address as retiring president. He emphasized the progress made in surgery in general during the past year, referring in particular to abdominal surgery. He pointed out some of the advantages of group practice, and recommended a closer affiliation between the biochemist, physiologist, physicist, and the bedside practitioner. At another time during the congress, he again referred to group practice and warned the members that unless in some manner they accomplish greater co-operation and less competition, then health insurance legislation and state control are surely coming.

Sir Berkeley Moynihan then gave an address upon the Murphy Memorial. It was an eulogy of the late Dr. J. B. Murphy, master surgeon of his time. A brief synopsis of the history of

medicine, illustrated by lantern slides, served to carry the mind of the audience from Hippocrates, as the father of all medicine, up through the ages to the present day, and thus to place correctly in the Hall of Fame the memory of Dr. J. B. Murphy.

2. Montreal clinics were taxed to accommodate such an assembly of America's surgeons. Most visitors found a fair amount of operative work however, in the particular fields they desired, whether it was the head, extremities, pelvis, abdomen or thorax.

Most of the scientific programs were full, but not over-long. Speakers were held to time, and their talks were snappy with emphasis on the cardinal essentials. Just enough of the technical and didactic was given to stimulate but not to tire the practical surgeon.

There were exhibits of Sir William Osler's personal collection of pathological and anatomical specimens.

The exhibits of McGill University were most interesting; likewise the Canadian war exhibit and others. The French and (to a lesser degree) Canadian elements in the congress environment were just sufficient to remind one from the States that he was really in a foreign country and being delightfully entertained.

3. The work of standardizing hospitals is no longer new. Truly it is less far advanced than the standardization of medical colleges, for example; but none the less certainly under way. Not only has the A. C. S. undertaken to push this splendid activity, but the A. M. A. through its state associations, the American Hospital Association, both Catholic and Protestant, the Association of American Medical Colleges through its search for interneships, et cetera, are accomplishing much.

4. The terminal session of the congress consisted of convocation services, at which the newly elected candidates were presented, and of addresses by President George E. Armstrong of Montreal and Sir William Taylor of Dublin. Dr. John Deaver was elected president for the ensuing year, and it is likely that the next congress will be held in his home city, Philadelphia.—*J. Stanley Welch, Lincoln, Nebr.*

Editorial

READING THE BIBLIOGRAPHY

The editor finds that there are a few of our readers who consider the bibliography published in each issue to be occupying space that might better be devoted to something else. On the other hand, there have been quite a few letters indicating there are those who appreciate and enjoy, and profit by the pages devoted to this monthly index of current orthopedic literature.

To the editor himself, the bibliography has always been an interesting, as well as a profitable literary pastime. By way of directing attention to the several useful and entertaining features of the monthly bibliography which is published in this issue, it is desired to point out some of the details which may be elicited by a perusal of the collection of authors and titles for the current month.

One is attracted first of all, by the fact that there has recently been published in the Archives de Medicin et Pharmacie, Vol. 72, 1920, a collection of articles which will stir the memory of every officer who served with the British and the French. Included in the collection in this one publication, are articles by Bronomo, Sir Arthur Bowlby, DePage, Leriche, Neuhof, Tuffier (who talked to us so well at the Red Cross conferences in Paris), and Willems. Col. G. E. Brewer, who visited many of the hospitals in France, in this same issue reports his knee joint experiences in an evacuation hospital in France. Two of the younger men, Jelks and McGuire, now have articles published in widely separated portions of the country. Both Dr. Jelks and Dr. McGuire are young officers who did fine work as divisional officers at the front, and were later on duty at Savenay.

W. G. Turner is one of the Canadian surgeons who has done much fine work. The British used the Turner Splint in nearly all of their War Hospitals to assist in the extension and flexion of stiffened joints.

The editor of the Journal had the pleasure of meeting Dr. Turner's brother, General Turner, when he was touring the British Isles with the Premier of Canada, in 1918.

Ellis Jones of Los Angeles, and Fosdick Jones of Denver, whom most of the readers of this Journal know, have recent articles on fracture of the spine, of the tibia, and fracture of the femur. All of these articles have a personal as well as a professional interest to many orthopedic surgeons.

On the other side of the balance, one may find articles to arouse discussion or debate. There is for example, the article of Dr. E. H. Smith of San Francisco, which was published in the Medical Record. Dr. Smith would lead us away if he could, rather than follow on with the lessons of the war in regard to fractures. The editor is too critically inclined to discuss Dr. Smith's article at length here, but hopes that someone will take issue with some of his statements and uphold the present tendency toward standardization of splints.

Dr. Yergason has an article on the use of the Sinclair skate in Hawley's high bridge splint. The editor has not seen this article, but he has seen the high bridge splint, and feels that most readers should adhere in the use of the Sinclair skate more closely the teaching of Thomas and Sir Robert Jones than can be done by any such radical departure as this particular splint.

The editor desires to encourage all readers of the Journal, not merely to glance at the biblography, but to read it through for the sake of meeting old friends, for the sake of finding out what is being published in orthopedic literature, and also that interesting titles may be followed to the journal in which the full text of the article is published. In this way our readers and writers elsewhere may keep more closely in touch with things orthopedic than can be done in the pages of any single journal except through a thorough and interesting biblography.

News Notes

Dr. J. Torrance Rugh, Clinical Professor of Orthopedic Surgery and a member of the American Orthopaedic Association, delivered the address at the opening exercises of the Women's Medical College of Philadlephia, September Twenty-fifth.

Dr. R. Wallace Billington has removed his offices to 180 Eighth Avenue, North Nashville. He has associated with him Mrs. Louise Beatty of the Dominion Orthopaedic Hospital, Toronto, as assistant in physical therapy.

Dr. William Arthur Clark, formerly of St. Lukes' Hospital, Chicago and the Mayo Clinic, has announced the opening of offices for the practice of Orthopedic Surgery at 408 Central Building, Pasadena, California.

Dr. Edward S. Hatch of New Orleans has removed his offices from the Maison Blanche Building to 3439 Prytania Street. Miss Sue Cannon Price in charge of medical gymnastics is associated with Dr. Hatch.

There will be a meeting of the Central States Orthopedic Club in Chicago on Nov. 19th, and in Milwaukee on Nov. 20th, 1920. The club was organized in 1913 and since that time meetings were held once or twice during the year, except during the period of the war. The organization has grown rapidly and the widespread interest manifested gives indication that the coming meeting will be very well attended. The meetings thus far have been largely clinical in character, no papers being read. Free and informal discussion has been a feature of importance in the meetings thus far, and has made them enjoyable and profitable.

Doctor R. Tunstall Taylor of Baltimore, writes that the Kernan Hospital has received, recently, a gift of twelve acres adjoining the Hospital grounds, which are now within the city limits. The Hospital is enlarging its agricultural activities, among other

things planning for a chicken farm of three thousand laying hens. The income to the Hospital last year exceeded expenses by three thousand dollars.

Doctor Taylor writes also that a group associated with him for private practice in Baltimore now consists of the following:

Doctor J. Fletcher Lutz, Roentgenology, late Major and Chief of Service at Ft. McHenry; Doctor S. Cole Bowers, Roentgenology, Franklin Square Hospital (Pediatrics); Doctor Benjamin Tappan, Johns Hopkins Hospital; Doctor J. N. Reik, Eye, Ear, Nose and Throat Hospital; Doctor George H. Grove, Internal Medicine and Clin. Micros., Union Memorial Hospital and University; Doctor J. P. Bell, Dental Surgeon; Doctor A. Ben Jaeggin, Physiotherapy.

Orthopaedic Titles in Current Literature

Prepared by Dr. J. E. M. Thomson, Lincoln, Nebraska.

Abercrombie, R. G.—Physiopathic Paralysis of the Hand and Its Causation. Brit. Med. J., 1920, I. p. 764.

Axhausen—Origin of Loose Solitary Bodies in Knee Joints. Deutsche Medizinische Wohenschrift, Berlin, June 17, 1920, 46, No. 25, p. 825.

Bade, P.—The Treatment of Flat-foot. Ztschr. f. Aerztl. Fortbild, 1920, XVII, p. 36.

Baker, Robert H.—Compression Fracture of the Vertebral Bodies with Report of Seven Cases. Surg. Gyn. & Obst., Oct. 1920, Vol. 31, No. 4, p. 359.

Barre, F. T. and R. Schraff—Sympathetic Disturbances in Arms with Low Cord Disease. Revue Neurologique, March, 1920, 27, No. 3, p. 225.

Beth—Case of Peripheral Pressure Neuritis with Tetany. Wiener Klinische Wochenschrift, Vienna, Aug. 5, 1920, 33, No. 32, p. 701.

Black, J. O. Milne—Two Cases of Unilateral Macrosomia and Congenital Overgrowth of Right Leg. British Journal of Children's Diseases. April-June, 1920, 17, Nos. 196-198, p. 79.

Blanc, Y. Fortacin—New Method of Obtaining Fixation of the Joints. Med. Ibera, XI, p. 191.

Blencke, H.—The Causation of the Subcutaneous Rupture of the Biceps Brachii. Muench Med. Wchnschr., 1920, LXVII, p. 17.

Bonney, T. C.—Congenital (hereditary) Absence of Middle Joint of Little Finger. Am. J. of Roentgenology, July 1920, 7, No. 7, p. 336.

Bonomo—The End Results of Fractures of the Femur. Arch. de Med et Pharm. Mil., 1920, LXXII, p. 33.
Laminectomy. Arch de Med et Pharm. Mil., 1920, LXXII, p. 174.

Borchgrevinc, O.—Amputation of the Leg. Ann. Surg., 1920, LXXI, p. 697.

Borzini, A.—Deep Lipoma in the Thigh. Tumori, Rome. 1919, 7, No. 1, p. 28.

Bowen, C. F.—Fractures of Bones of Face. Am. J. of Roentgenology. July, 1920, 7, No. 7, p. 350.

Bowlby, A.—The Results of Gunshot Fractures of the Femur and a Review of the Methods Used in France in 1918. Arch. de med. et Pharm., 1920, LXXII, p. 40.

Brenner, A.—Knee Joint Injuries in War. Wiener Klinische Wochenschrift, Vienna, Aug. 5, 1920, 33, No. 32, p. 703.

Brewer, G. E.—A Series of Wounds of the Knee Joint Operated Upon at an Evacuation Hospital. Arch. de med. et Pharm. mil., 1920, LXXII, p. 85.

Buckley, W. F.—Reformation of Elbow Joint. Lancet, London, Aug. 7, 1920, 2, No. 6, p. 294.

Cadwalader, W. B.—Report of the Condition of a Case of Complete Division of the Spinal Cord by a Gunshot Wound Nineteen Years After the Injury. Ann. Surg., 1920, LXXI, p. 719.

Campbell, W. C.—Ununited Fractures of Neck of Femur. Southern Med. J. Aug., 1920, 13, No. 8, p. 585.

Coley, W. B.—Sarcoma of Clavicle; End Results Following Total Excision. Annals of Surgery. Aug., 1920, 72, No. 2, p. 231.

Condict, W. L.—Bilateral Congenital Dislocation of the Head of the Radius. Ann. Surg., 1920, LXXI, p. 798.

Coues, W. P.—Case of Dislocation of Carpal Scaphoid. Boston, Med. & Surg. Journal, Aug. 26, 1920, 183, No. 9, p. 260.

Crile, G. W.—Treatment of Septic Fractures. Ill. Med. Journal. Aug., 1920, 38, No. 2, p. 144.

Debernardi, L.—Pseudarthrosis of Hip Joint. Chirurgia degli Organi di Movimento, Bologna, May, 1920, 4, No. 2, p. 197.

Delgado, E.—Reconstruction of Forefinger. Anales de la Facultod de Medicina, Lima, May-June, 1920, 3, No. 15, p. 248.

Delitala, F.—Rubber for Orthopedic Splints. Chirurg delgi organi di movimento, Bologna, May, 1920, 4, No. 2, p. 269.

De Page—The Treatment of Purulent Arthritis of the Knee. Arch. de Med. et Pharm mil., 1920, LXXII, 66.

Derache—The End Results of Fractures of the Femur. Arch. de med et pharm mil., 1920, LXXII, p. 14.

Douglas, J.—Fat Transplant for Adhesions after Tenorrhaphy. Ann. Surg., 1920, LXXI, p. 791.

Eliot, E.—Etiology, Pathology and Clinical Features of Benian Exostoses. Annals of Surgery, Philadelphia. Aug., 1920, 72, No. 2, p. 228.

Faltin, R.—Bone Transplantation. Finska Lakaresallskapets Handlinger, Helsingfors, May-June, 1920, 62, No. 5-6, p. 299.

Finlayson, A. D.—A Typical Case of Progressive Muscular Dystrophy. Neurological Bull., N. Y., Nov.-Dec., 1919, 2, Nos. 11 & 12, p. 431.

Finsten, R. V.—Suggestions from the Brace Shop. J. Orthop. Surg., 1920, N. S,, 11, p. 345.

Forbes, A. Mackenzie—Technique of an Operation for Spinal Fusion as Practised in Montreal. J. of Orthop. Surg., Sept., 1920, Vol. 2, No. 9, p. 509.

Fowler, R. H.—Bone Cysts. Med. Times, 1920, XLVIII, p. 129.

Frenelle, D. de—Reconstruction of Joint Ligaments. J. de Chirurgie, Paris, 1920, 16, No. 4, p. 399.

Frey, H. and K. Orzechowski—Ostosclerosis in Relation to Tetany. Wien Klinische Wochenschrift, Vienna, Aug. 5, 1920, 33, No. 32, p. 697.

Goulart, F.—The Treatment of Fractures of the Limbs with the Apparatus Devised by Pierre Delbert. Brazil med., 1920, XXXIV, p. 290.

Greutzner, R.—Traumatic Paresis of the Intercostal Nerves. Neurol. Zentralblat., 1920, XXXIX, p. 11.

Grob—Perthe's Disease. Schweiz med. Wchnschr., 1920, 1, p. 493.

Gutierrez, A.—Case of Multiple Osteomas and Sarcomatous Epulis in Woman. Semana medica, Buenos Aires, May 6, 1920, 27, No. 19, p. 715.

Hallopeau, P. and R. Gouverneur—Treatment of Wounds of Vertebral Artery. J. de Chirurgie, Paris, 1920, 16, No. 4, p. 369.

Hamburger—Sun-lamp in Treatment of Children. Deutsche medizinische Wochenschrift., Feb. 5, 1920, 46, No. 6, p. 147.

Hammond, R.—Pain in the Great Toe from Adhesions of the Internal Sesamoid Bone. J. of Orthop. Surg., Sept., 1920, Vol. 2, No. 9, p. 506.

Harris, R. I.—An Operation for the Relief of Median Anaesthesia. J. of Orthop. Surg., Sept., 1920, Vol. 2, No. 9, p. 519.

Hitzrot, J. M.—Myxochondrosarcoma of the Humerus, (Five Years after Operation). Ann. Surg., 1920, LXXI, p. 787.

Hofheimer, J. A.—Exostoma of the Toe; Emergency Suggestions. Internat. J. of Surg., 1920, XXXIII, p. 184.

Holfelder, H.—The Surgical Treatment of Bone and Joint Diseases in Tabes Dorsalis. Zentralbl. of Chir., 1920, XLVII, p. 30.

Honey, James A.—A Study of Multiple Cartilaginous Exostoses; Four Cases with Report of the Calcium and Magnesium Metabolism in Two Cases. Arch. Int. Med., 1920, XV, p. 584.

Jelks, E.—Common Surgical Conditions of the Knee. Florida. Med. Assoc. J., Aug., 1920, 7, No. 2, p. 20.

Johnson, F.—The Hygiene of the Feet and Physical Efficiency. Lancet, 1920, CXCVIII, p. 1342.

Jones, E.—The Treatment of Compound Fractures of the Femur. Northwest Med., 1920, XIX, p. 143.

Jones, S. Fosdick—Fracture of Tibial Spine. Colo. Med., Aug., 1920, 17, No. 8, p. 217.

Julliard, C.—Fibro-Adipose, Cartilage and Bone Grafts in Reparatory Surgery. Rev. Med. de la Suisse Rom., 1920, XL, p. 211.

Kaiser, Fr.—Patellar Tumors. Beitrage zur Klinischen Chirurgie, Tubingen, 1920, 120, No. 1, p. 239.

Kausch—Recurring Subcutaneous Mucoid Tumor of the Entire Forearm. Berl. klin. Wchnschr., 1920, LVII, p. 128.

Kisch, E.—Heliotherapy of Tuberculosis of the Bones and Joints. Ztschr. & Aerztl. Fortbild., 1920, XVII, p. 300.

Krafbe, K. H.—Congenital Familial Spinal Muscular Atrophies and their Relation to Amyotonia Congenita. Brain, London, July, 1920, 43, Part 2, p. 166.

Lane, W. A.—A Rare Fracture of the Lower End of the Humerus. Med. Press. 1920, CXIX, p. 409.

Langley, J. N.—Treatment of De-nervated Muscle; "Disuse" Theory. British Med. Journal, London, Aug. 14, 1920, No. 3111, p. 239.

Leriche, R.—The End-results of Wounds of the Joints. Arch. de med. et pharm. mil., 1920, LXXII, p. 71.

Lotsch, F.—Chondromatosis of a Capsular Ligament. Deutsche med. Wchnschr., 1920, XLVI, p. 544.

Lupo, M.—Supernumerary Bones in Tarsus. Chirurgia degli Organi di Movimento, Bologna, May, 1920, 4, No. 2, p. 141.

Mauclaire—Cartilage Grafts. Presse Medicale Paris, Aug. 11, 1920, 28, No. 56, p. 545.

McGuire, F. W.—The Treatment of Compound Fractures. Am. J. Surg., 1920, p. 164.

McWhorter, G.—Chondroma of the Thumb. Surg. Clin., Chicago, 1920, IV, p. 629.

McWilliams, C. A.—Mobilization in Injured, Infected and Fractured Joints. Med. Record, Sept. 4, 1920, 98, No. 10, p. 519.

Miller, O. R.—The Treatment of Congenital Club Foot. Ann. of Surg., 1920, XXXIV, p. 165.

Moodie, R. L.—The Antiquity of Pott's Disease and Other Spinal Lesions; Primitive Treatment. Surg. Clin., Chicago, 1920, IV, p. 619.

Moreau, L.—Comminuted Fractures of the Sacrum Without Nervous Lesion. Progres Medical, Paris, July, 17, 1920, 35, No. 29, p. 318.

Moszeik—Loss of Arm Close to the Shoulder by Trauma. Med. Klin., 1920, XVI p. 576.

Mott, F. W.—A Lecture on Early Symptoms and Diagnosis of Diseases of the Spinal Cord. Brit. Med. J., 1920, 1, p. 857.

Mouchet, A.—Some Cases of Limb Surgery. Univ. de Montevidio, 1919, IV, p. 773.

Neugebauer, G.—Longitudinal Fractures of the Patella. Med. Klin., 1920, XVI, p. 499.

Neuhof, H.—Remarks on the Operative Treatment of Gunshot Wounds of the Spine with Grave Paralysis. Arch. de med. et Pharm. Mil., 1920, LXXII, p. 162.

Noon, C.—The Story of a Spinal Injury. J. Roy. Army Med. Corps, London, 1920, XXXIV, p. 527.

Nuzzi, O.—Deformity from Missing Tibia. Chirurgia degli organi di Movimento, Bologna, May, 1920, 4, No. 2, p. 164.
Tenotomy of Achilles Tendon. Chirurgia degli organi di movimento, Bologna, May, 1920, 4, No. 2, p. 339.

O'Brien, F. W.—Uncomplicated Fracture of Carpal Zygomatic Arch; Report of Two Cases. Boston Med. & Surg. Journal, Aug. 26, 1920, 183, No. 9, p. 262.

Perret, C.—Treatment of Multiple Fractures of Both Legs. Rev. med. de la Suisse Romande, July, 1920, 40, No. 7, p. 415.

Port, K.—Chronic Rheumatism Cases Important for the Orthopedic Surgeon. Arch. f. Orthop., 1920, XVII, p. 465.

Putti, V.—Arthroplasty of the Knee Joint. (Translation) J. of Orthop. Surg., Sept., 1920, Vol. 2, No. 9, p. 530.

Powers, C. A.—Management of Septic Joints, after Method of Willems. Colo. Med. Aug., 1920, 17, No. 8, p. 204.

Ranchen, D.—Influences Affecting Muscular Energy. Fincka Lakaresallskapets Handlinger Helsingfors, May-June, 1920, 62, No. 5-6, p. 281.

Rathery and Bordet—Post-traumatic Osteomas in Muscles. Bull. de la Societe Medicale des Hospitaux de Paris, June 4, 1920, 44, No. 20, p. 772.

Reh—Usefulness of the Hand after Adhesions of the Flexor Tendons of the Ring Finger. Monatschr. J. Unfallheilk, 1920, XXVII, p. 19.

Reiley, W. A.— Osteochondral Trophopathy of Hip Joint, Legg's Disease, Report of Four Cases. Am. J. of Roentgenology, July, 1920, 7, No. 7, p. 347.

Revel, J.—Temporary Disarticulation of the Foot for Tuberculosis. Revue de Chiriurgie, Paris, March, 1920, 39, No. 3, p. 205.

Rieger, H.—Pathogenesis of Loose Bodies in Joints. Munchener Medizinische Wochenschrift, Feb. 20, 1920, 67, No. 8, p. 719.

Rivers, W. C.— Stigmata of Predisposition to Bone and Joint Tubercle. Brit. J. of Children's Diseases, April-June, 1920, 17, Nos. 196-198, p. 59.

Roederer, C.—Prostheses for Stump of the Thigh. Paris Medical, June 26, 1920, 10, No. 26, p. 519.

Ryerson, E. W.— Traumatic Osteomyelitis as Seen During the War. J. Orth. Surg., Sept., 1920, Vol. 2, No. 9, p. 499.

Schlesinger—To make Best Use of Cineplastic Arm Stumps Deutsche medizinische Wochenschrift, March 4, 1920, 46, No. 10, p. 262.

Schusser, O.—Dextrocardia with Supernumerary Vertebrae with Ribs. Deutsche medizinische wochenschrift, June 10, 1920, 46, No. 24, 658.

Schweizer, R.—Trauma of Lower End of Femur. Schweizerische Medizinische Wochenschrift, May 20, 1920, 50, No. 21, p. 402.

Schwyzer, G.—Tuberculosis of the Joints; Rollier's Heliotherapy. Surg. Gyn. & Obst., 1920, XXX, p. 58.

Smith, E. H.—Fractures of Long Bones and their Repair. New York Medical Journal, Sept. 4, 1920, 112, No. 10, p. 301.

Spier, H. W.—An End-Result Study of Arthrodesis for Non-Tubercular Affections of the Hip Joint. J. of Orth. Surg., Sept., 1920, Vol. 2, No. 9, p. 515.

Stoppato, U.—Projectiles in Vertebrae. Chirurgia degli Organi di Movimento, May, 1920, 4, No. 2, p. 123.

Sutherland, R. W. and J. M. Christie—Some Notes on Military Orthopedics. Brit. M. J., 1920, 1, p. 762.

Thomas, T. T.—Personal Experience with the Treatment of Fractures. Penn. M. J., 1920, XXIII, p. 459.

Todd, M. E.—Principles of Posture; First Paper. Boston M. & S. J., 1920, CLXXXII, p. 645.

Tonnini, L.—Index Finger as Substituted for Thumb. Chirurgia degli Organi de Movimento, Bologna, May, 1920, 4, No. 2, p. 213.

Toupet, R.—Torsion Arthrodesis for Drop-Foot. Journal de Chirurgie, Paris, 1920, 16, No. 3, p. 268.

Tuffier and Forgue—The End Results of the Treatment of Fractures of the Femur. Arch. de med. et Pharm. Mil., 1920, LXXII, p. 22.

Turner, W. G.—Recent Advances in Tendon Transplantation and Bone Grafting. Canadian Med. Ass. J., Aug. 1920, 10, No. 8, p. 705.

Vacchelli, S.—Arthrodesis for Shoulder Paralysis. Chirurgia degli Organi di Movimento, Bologna, May, 1920, 4, No. 2, p. 753.

Valentin, B.—Increased Bone Growth and Coxa Valga in Bone Tuberculosis. Arch. J. Orthop. 1920, XVII, p. 379.

Vanderhool, D.—Spondylitis and Abdominal Pain with a Discussion of Nerve-root Symptoms, simulating Visceral Disease. J. Am. M. Ass., 1920, LXXIV, p. 1689.

Weber, F. P.—Unilateral Dwarfism of Limbs Connected with Congenital Multiple Chondroma. Brit. J. of Children's Diseases, London, April-June, 1920, 17, Nos. 196, 198, p. 85.

Willems, C.—The End-Results of Wounds of the Joints. Arch. de med. et Pharm. mel., 1920, LXXII, p. 51.

Wilson, G. E.—Spinal Injury. Hahneman Month., 1920, Lv, p. 337.

Woldenberg, S. C.—Pathology of the Knee Joint in Relation to X-Ray Findings. Surg. Gyn. & Obst., Oct., 1920, Vol. 31, No. 4, p. 366.

Woloshinsky, A.—Case of Syphilitic Kyphosis. Deutsche medizinische Wochenschrift, Berlin, March 4, 1920, 46, No. 10, p. 267.

Yellowlees, D.—Psychotherapy in General Practice. Glasgow Med. J., Aug. 1920, 94, No. 2, p. 91.

Yergason, R. M.—Adaptation of the Sinclair Skate to the Thomas High Bridge Splint. J. A. M. A., Sept. 11, 1920, Vol. 75, No. 11, p. 740.

Young, James K.—Hyperthrophy of the Head of the Fifth Metatarsal. J. of Orth. Surg., Sept., 1920, Vol. 2, No. 9, p. 527.

Current Orthopaedic Literature

RHEUMATISM. Dr. K. Port. *Archiv f. Orthopaed. und Unfall-Chirurgie.* Band XVII, Heft 3, 1920. Seite 465-506.

Chronic rheumatism is the collective name for a large group of affections of the joint-muscle and other connective tissues. The name is only in use because exact pathologic knowledge is still wanting. The author claims for this group the name chronic rheumatism because: it allows a distinct separation from the other diseases so named and it offers a uniform character which permits a definite diagnosis and a differentiation from all the similar conditions.

This group possesses:

1. A uniform etiology, namely, a lingering cold. The exposure to cold never occurs when the patient is in motion, but when muscles and joints are at rest. Therefore it is prevalent in people with sedentary occupations.

2. The characteristic symptomotology is: Long duration with acute exascerbations of pain, which are distinctly dependent upon "catching colds" and the change of weather.

3. A constant clinical finding: infiltration of tissues of the joints, of the muscles, the subcutanous tissues and nerves. This infiltration is distinctly palpable and resembles the residue which remains in tissues after trauma. A similar induration, well circumscribed and of various sizes, can be palpated.

4. The specific treatment is massage and exercises. The massage must be thorough and painstaking. Each and every point of infiltration must be discovered and kneaded most thoroughly. The treatment is tedious but, if carefully carried out, will lead to complete recovery in nearly all cases. The success of this treatment is so certain, that the author regards it as a pathognomonic sign of this group of rheumatism.—*A. Gottlieb, San Francisco, Calif.*

TREATMENT OF ACUTE POLYARTHRITIS By S. W. Boorstein, M. D., *Med. Record,* July 17, 1920.

If you see the case early look for the source or sources of infection and clear them up if you can. Do not stop at the teeth, but examine the throat. Infected tonsils, even if not enlarged are often the cause of infectious arthritis. The intestinal tracts and genito-urinary tract should not be forgotten. Try to remove all sources of infection as soon as possible, even if you are not sure that they are the causes.

GENERAL TREATMENT

Environment.—As long as the patient is guarded against exposure to cold and moisture, he may be kept in the city.

Combating the Infection.—Increase elimination of toxins through the natural channels. In the beginning give strong purges, then laxatives should

be given. Mineral oil may be used freely. Enemas or high colon irrigations. Diuretics should be given freely.

Diet.—A full nutritious diet is necessary. Meat should not be withheld even during the acute stage. Plenty of milk and fruit (cooked or raw). Two or three glasses of buttermilk a day.

Medication.—All forms of salicylates should be avoided. Only those drugs aimed to promote digestion, proper bowel activity, proper circulation, and proper character of the blood should be used. (Strychnine, Arsenic, Iron preparations.) In chronic cases Cod liver oil can be added. During the acute or subacute stage, hypodermic injections of Sod. Cacodylate in ¾ to 1¼ grain doses, every four or five days, have been found of great help in increasing the resisting power. Tr. Gelsemium m v t. i. d., may be used to relieve pain. If intestinal putrefaction is present, guaiacol carbonate grs, v. t. i. d. may be given. The author believes that it is absolutely worthless to give vaccines, perhaps even harmful.

Local Treatment

Immobilization.—As soon as the patient complains of pain, the joint should be immobilized in a well padded circular plaster cast. The position of the joint should be properly selected, the knee in extension, the ankle at right angles, the elbow flexed, the wrist slightly hyperextended. The cast should be left on for eight or ten days and is then halved. It is then left on during the night and only part of the day, being removed during the application of other local measures. The duration of the wearing of the plaster is gradually shortened.

Active hyperemia.—Contrast baths, or alternate compresses of hot and cold water. Bathing limb in hot water with Epsom salt. The bathing may be done three or four times daily. Baking is of great benefit. It should be used after the cast has been opened. The temperature of the machine must be gradually increased to 250° to 300° F. The application should be given for ¾ hour. Electrically heated apparatus is the best. Baking should be given every day during the acute attack; later on three times a week.

Bier's passive hyperemia produced by means of a thin elastic bandage, is also of benefit. The constriction must be just enough to cause a narrowing of the superficial veins. The application is painful during the acute attack if it is not applied correctly. Begin to use it two or three hours a day and increase duration of application gradually to 22 hours a day, the bandage being removed for one hour twice daily when the limb is to be raised to allow the return of circulation.

Massage.—This is of the greatest value if it can be carried out properly. It is that part of the treatment most commonly abused and perhaps also the one responsible for many disabling deformities. Massage should not be used as long as redness, tenderness and other signs of inflammation are present. It should be given three or four times a week in the acute cases. In chronic cases it may be given five times a week. The massage should be given mostly to the muscles and not much to the joint itself. In hospital cases general massage and particularly abdominal massage should be added.

Exercises.—Active exercises are of the greatest value and should be begun as soon as the inflammation begins to subside. Passive exercises may be used in the chronic cases. Occupational therapy has been found superior to the use of Zander machines.

Hydrotherapy is of benefit; but it is not advisable to depend entirely on this mode of treatment and send patient away to spa.

Electrical treatments.—Valueless, and some forms even harmful.

CONCLUSIONS

1. The disease has no relation to rheumatism and anti-rheumatics should be avoided.

2. A focus of infection should be looked for in every case of arthritis where tuberculosis, malignancy or trauma is not self-evident. The finding of a focus does not mean that this is the only one. The source of infection suspected should be removed if possible.

3. Monarticular arthritis demands the same careful investigation as a case of polyarthritis, for one can never tell when the former may merge into the latter.

4. Prophylaxis in preventing systemic infection and keeping the genito-urinary and gastro-intestinal tracts in good condition is essential. Removal of chronic foci anywhere in the body is imperative as a prevention of progressive ill health.

5. The arrest of infection does not mean that the joint condition will be cured, unless orthopedic measures are employed.

6. General treatment, such as good hygiene, good food, tonics, is essential to success.

7. Acutely inflammed joints should be put in well padded plaster casts.

8. When acute symptoms subside, local treatment to the joint in the form of active and passive hyperemia, hydrotherapy, massage, active and passive exercises, should be administered regularly with great care and patience, and kept up for a long time.

9. Deformities should be prevented by steadying the joints in the best positions during the acute stage.—*Mark Cohn, M. D.*

OBJECTIVE SYMPTOMATOLOGY OF FOOT STRAIN. Albert H. Freiberg, M. D., Cincinnati. *Jour. A. M. A.*, August 14, 1920, Vol. 75, No. 7.

We are unable to tell, from the appearance of a foot to what extent it is or may be the cause of suffering and consequent disability. A foot may perform its functions painlessly and without fatigue for a long time in the presence of abnormal relations between the foot and the leg, or relations between the bones of the foot. Individuals with such abnormal conditions bear in them the potential factors of disability, which require only the added element of unusual functional demands, trauma, or infection to call forth a situation which will bring them to us for aid. When this time comes it is often the case that the symptoms are localized at a distance from the foot which, after

correct analysis, must be recognized as the fundamental source of trouble. Failure to recognize this means failure to apply the remedy which will be effective.

What is not generally appreciated with regard to the foot is that a very large number of persons, by reason of their foot gear, have reduced their muscular working limit to such an extent that the strain of further function makes itself felt in loco or at a distance without apparent cause.

The foot pains are a reaction of the periosteal attachments of the ligaments which are under abnormal stress on account of muscular insufficiency. With visible mechanical maladjustments at the lower end of the leg, disturbances of the lines of weight bearing and muscular balance may hinder function in the knee, hip and even the spinal joints. Many individuals with feet muscularly impaired are succeeding in maintaining a correct general posture, but this cannot be done without improper expenditures of muscle power elsewhere.

A thoughtful examination of the anatomy of the foot with respect to the purpose of its structure may well be looked to in order to form a conception of the true meaning of some of the abnormal manifestations there to be observed. That the foot is not meant to be a merely passive support for the body, a pedestal on which to stand and walk, but rather a living organ with which to stand and walk, has become a truism, but one which is constantly being forgotten. Too much has been thought and said about the arches of the foot; too much, in other words, about its intrinsic structure and too little about its mechanical relationship to the rest of the lower extremity.

The most striking feature about the mechanism of the foot when regarded as a whole and with respect to its functional relationship to the leg, is the fact that its construction is such that a means must be provided to keep it in line with the rest of the lower extremity, during weight bearing. The transmission of the body weight to the ground takes place through a line corresponding to the axis of the tibia, passing through the center of the tibioastragaloid joint approximately, but which passes thru the os calcis not at its center but decidedly mesial or internal to this point. This may be seen in any anatomic drawing or ligamentous preparation of the foot, viewed from behind. The resulting tendency of the foot as a whole to cant inward, on the leg unless prevented by muscular action is emphasized in every description of the foot mechanism.

Roberts calls attention to the "globular contour of the inferior bearing surface of the os calcis." It seems quite right to say that the obvious purpose of this condition of mechanical instability is to provide for elasticity of gait through the muscular control.

The ligamentous checks to motion in pronation and abduction lie in the internal lateral ligament of the ankle chiefly. This ligament, otherwise spoken of as the deltoid ligament, is a composite structure made up of several bands. The band of greatest interest is that one which, attached above to the tip of the internal malleolus, has an almost vertical course downward, being inserted below to the innermost border of the sustentaculum tali. This band is called the tibiocalcaneal ligament. It may easily be seen that when any movement in pronation is not sufficiently controlled by muscular action, stress

will first of all fall on the tibiocalcaneal ligament; if we imagine the os calcis being allowed to cant inward, as it will tend to do under these circumstances, this sea will be the seat of a cross-breaking strain where it is attached to the inner border of the sustentaculum. Since pronation and abduction of the foot are practically always associated, the tendency is for the head of the astragalus to rotate outward on the os calcis; this implies a movement inward of the posterior part of the astragalus. The ligamentous check to this movement is found in a short band which is attached to the posterior process of the astragalus behind, and which passes almost horizontally forward to the posterior end of the sustentaculum. In the case of latent weakness of the muscles controlling supination and abduction, even though no deformity in the opposite direction be apparent, we shall be able to comprehend that abnormal stresses are continually falling on these two ligamentous bands and that their periosteal attachments are under these circumstances likely to be tender to pressure, for this reason.

I test the sustentaculum for tenderness. Probably all people who had undoubted foot strain were tender at this place, whether deformity of the foot was present or not.

1. Persons who have symptoms which may be attributed to weakness of supination and adduction of the foot practically always have tenderness of the insertion of the tibiocalcaneal ligament into the sustentaculum tali, or at its posterior extremity.

Many persons who have no foot symptoms have tenderness on pressure over this point; this is also true of many persons who have no symptoms attributable to the lower extremities at all.

4. Most persons with strong symptomless lower extremities are not tender on pressure over the sustentaculum. This tenderness is to be regarded as indicative of potential weakness in adduction and supination. This is true in proportion to the ease in which tenderness is called forth.

The functional interdependence of the individual segments of the lower extremity has been referred to in the first part of this paper. This has long been recognized in an indefinite manner as the result of clinical experience. Patients with foot strain have told us time and again how they suffered from fatigue and pain in the legs, thighs and back, and we have been able in such cases to dispose of these symptoms by attention to the malposture of the feet. Lowman has shown the importance of the external rotators of the thigh in maintaining the proper relations of the leg to the foot; he has set forth the possibility of assisting the restoration of normal muscular balance by gymnastic cultivation of this group of muscles. It has been my experience to find this statement corroborated in practice. In fact, I am now disposed to regard the exercises of the external thigh rotators as by all means the most important at my disposal.—*Leo C. Donnelly, Detroit.*

PREVENTION AND TREATMENT OF WEAKFOOT IN CHILDREN. By Percy Willard Roberts, M. D., New York. *Jour. A. M. A.*, Vol. 75, No. 4, July 24, 1920.

It has been demonstrated that rotation of the os calcis on its anteroposterior axis controls the degree of strain which the longitudinal arch is called on to bear, and that by directing the course of such rotation outward, foot strain may be prevented and weakfoot overcome.

If through mechanical support and muscle training its balance is maintained thru the period of growth, there will result a normal foot, architecturally correct and muscularly strong enough to meet all the demands made upon it in the years to come. As foot troubles in adult life have their origin many times in improper development of the pedal tissues in early childhood, it is evident that the subject under discussion is one deserving of more consideration than it usually receives.

At the end of the first year of life, when the baby begins to stand, the bones are hardly more than an orderly arrangement of cartilaginous masses. Centers of ossification are present in the astragalus, os calcis and cuboid at this time, but they do not appear in the other bones of the tarsus until one to three years later. They will grow into perfect or imperfect bones as circumstances may ordain.

The three factors which commonly disturb the formation of the foot are improperly designed shoes, unequally developed leg muscles, and a deviation in the normal mechanical relations between the tarsus and the leg. The bottom of the os calcis is approximately an arch and the weight of the body is resting on a single point representing the center of balance of this bone. So long as the thrust of the body weight is carried directly over the center of balance, the bone will not tilt; but if it is shifted, let us say to the medial side, the bone will rotate inward. The ligaments on the bottom of the foot bind the os calcis and the bones anterior to it so firmly together that they must move as one mass. Inward tilting of the heel bone will lower the inner border of the foot and pronation becomes an established fact with the consequent evil of strain on the ligaments of the longitudinal arch. The result of long-continued strain of this nature will ordinarily be stretching of these ligaments and the production of weakfoot. The prevention of this fault in attitude is possible if the young foot is properly trained. The most important single factor in the development of a normal arch is the maintenance of the upright position of the os calcis during the period of growth. In some cases it is necessary only to raise the inner border of the heel of the shoe to insure this result. In others, some firm mechanical appliance capable of grasping the heel will be indicated. It is the custom of the day, when a child has weakfoot, to put a plate in the shoe which presses up the arch. This seems physiologically and mechanically wrong,—physiologically wrong because constant pressure on the plantar tissues interferes with their development, and mechanically improper because the force is inefficiently applied. The correction can be much more readily obtained by an apparatus whose effective force is applied directly to the heel and the permanence of the results will be more certain.

Much can be done toward maintaining the proper alignment of the bones of the foot by muscle training; but the use of this measure must be deferred

until such time as the child is old enough to co-operate intelligently; therefore the question of shoes takes second place in any reasonable scheme of prophylactic supervision of foot growth.

During the first ten or twelve years of life, the foot should have ample room to expand laterally as well as to grow in length. To meet this condition, a proper shoe may be described as one which is sufficiently wide at the ball of the foot to avoid crowding the heads of the metatarsals together when the wearer is standing and in which the inner and outer borders of the sole maintain a straight line well beyond the great and little toes. The popular idea that the anterior part of a shoe should swing inward, a design so often seen in so-called "orthopaedic" lasts, is based on an entirely erroneous conception of the normal foot.

Although definite muscle training cannot be carried out effectively at an early age, something can be accomplished by teaching the child to walk on its toes and by devising simple games that will bring this attitude into play, thus helping to develop the strength of the anterior and posterior tibial muscles.

Maintenance of the upright position of the os calcis, or its rotation outward if there is any inclination to pronation may be comfortably achieved by the plates. Their efficiency has been proved in many hundreds of cases in the last five years, and they have been found to possess a definitely curative value in the treatment of weakfoot in children. Their function is to rotate the heel and this is accomplished by tilting the floor of the plate under the calcaneum and by pressure of a thumblike flange which engages the tissues over the inner side of the bone toward its posterior extremity.

Striking demonstrations of the actions of these plates is seen in cases of paralysis of the anterior tibial muscles which allows the foot to roll into the valgus position. Mild types of this deformity can be controlled by this device until the patient is old enough to undergo operation for a permanent correction.—*Leo C. Donnelly, Detroit, Mich.*

INJURIES OF THE SPINAL CORD. Alan Newton, M. D. *Medical Journal of Australia*, Vol. II, p. 30. July 10, 1920.

This paper is based on extensive research during the recent war. The subject is discussed under various headings, the first of which is:

1. Injury of the Spinal Cord without Injury of the Vertebral Column.

The term concussion is usually employed in a loose manner, but it should be used only to indicate the cause of an injury. It occurs usually as the result of nearby explosion or other compressing force producing gross lesions of the spinal cord without coincident lesion of the spinal column. The character of the lesion (Holmes) is diffuse and irregular in distribution, diminishing gradually from point of maximum disturbance, consisting of primary necrosis and parenchymatous change in cells and fibers associated with edema and small scattered hemorrhages. Similar results are reported by Claude and Lhermitte.

The author's experiments showed that the spinal cord was extremely sensitive to slight concussion and compression. The clinical signs (Roussy and Lhermitte) are extraordinarily variable and consist of interference of motor conductivity even to the extent of being indistinguishable from anatomical sections of the cord, making differential diagnosis difficult. They describe the clinical types: "forme quadriplegique, forme hemiplegique, etc." In these cases the motor and sensory functions are usually re-established in the course of a few weeks, tho permanent loss may remain. The cerebro-spinal fluid is clear, containing no blood or excess cellular elements. This is an exceedingly important point in differential diagnosis.

Hematomyelia, another cord condition coming under this heading, consists of hemorrhage into the grey matter of the cord. This may occur incident to a crushing injury of the cord, but usually as a focal lesion. It occurs usually in the cervical region, due to a fall on the head, the neck in acute flexion. Here the cord is more vascular and the connective tissue framework less dense, allowing the effusion to extend up and down through grey matter rather than outwards into the more resistant white matter. The clinical picture produced is that of flaccid paralysis of upper limbs, due to hemorrhage into the anterior cornua, and spastic paralysis of lower limbs caused by pressure on the lateral cortico-spinal motor tracts. The sensory disturbances consist of anesthesia to thermal and pain sense without impairment of the sense of touch. The paralysis subsides early, but weakness remains.

II. Injury to Vertebral Column without Injury to Spinal Cord.

The danger in this condition is that a rarefying osteitis may follow, causing kyphosis and pressure on the spinal cord (Kummel's disease), evidenced often by weakness in both upper and lower extremities. Laminectomy usually relieves.

III. Injury to Both Spinal Cord and Vertebral Column.

Prior to the war Horsley and others advocated early operation on these injuries in all doubtful cases. The result was not encouraging, and caused many surgeons to take a conservative view. The extent and nature of the lesions (Holmes) are:

1. The cord, when divided, has a considerable amount of clot and bone fragments between the ends.

2. In injuries of lesser intensity there is disintegration of a portion of cord, and a semi-fluid or custard-like material escapes on pricking the pia. Cross section may be blurred.

3. If injury be slight, the normal structure is only obscured and there may be slight hemorrhages. Subdural hemorrhages of considerable size may occur, but rarely large enough to compress the cord. (Interesting.)

4. Secondary degenerative changes in the neighborhood of the primary occur. Edema, though present, is not of inflammatory type. Affects the neurological matrix as well as nerve cells.

5. Distinct lesions may be found extending for four or five segments above and below the site of injury. These include edema, small hemorrhages, swelling of axis cylinders, focal necroses, and formation of cavities.

Walton pointed out that injury to cord was a result of momentum of the body, and caused at moment of injury. It must not be confused with con-

tinuous pressure exerted by depressed bone, if also present. Any increase in destruction of cord, due to irritation around, or pressure of a foreign body or depressed bone, will appear after an interval. It is therefore not essential to remove pressure at once. (Interesting.)

Many cases are reported where dura has not been perforated by depressed bone, yet after removal of latter permanent paraplegia remains, because the force of primary impact was sufficient to destroy cord. When the signs indicate complete lesion, operation is contra-indicated. If partial lesion, with possible continued pressure on cord, operation is indicated. If, in the case of partial lesion, there is no evidence of improvement, operation is indicated. In all cases, operation should be delayed until able to differentiate between partial and complete lesion.

Riddoch has grouped into three stages the clinical signs indicating complete and incomplete lesions:

Stage I. There is at first a period of flaccid paralysis with hypotonia, complete sensory loss and abolition of all reflexes, except that tonic contraction of the bladder and rectal sphincters persists. This stage lasts for a variable period, usually from one to three weeks.

Stage II. (a) In complete lesions: Reflexes, many of them complicated and showing adaptation to an end, can be evoked from an increasing reflexogenous area by a decreasing stimulus. These reflexes are flexor in type and overflow into other reflex arcs, so that soon a small stimulus causes an extensive response. To this phenomenon the name "mass reflex" is applied. This comprises flexor spasm of the abdominal wall and both lower extremities, evacuation of the bladder when its contents are half the amount at which it would otherwise empty itself, and sweating from an area of skin varying with the level of the lesion. At a later date knee and ankle jerks can be elicited, but these are not well sustained.

(b) In partial lesions: In this group extensor or static reflexes return at the same time as the flexor. The reflexogenous area is much more limited. Local signature is present—there is not the same wide spread of the reflex. The knee and ankle jerks return earlier and are well sustained. Extension of the contra-lateral limb may occur, simulating a movement of progression. An extensor thrust may be elicited by pushing up the distal portion of the sole of the foot.

Stage III. In the presence of septic complications, the reflex activity disappears and the limbs pass again into a state of flaccidity.

Milder cases of spinal injury are more obviously incomplete. In cases I and II, for example, there was not a total sensory loss, the clinical picture being that of a Brown Sequard syndrome.

In order to determine the type of vertebral injury, radiographic examination should be carried out in all cases of this nature. I wish to emphasize the importance in thoracic lesions of taking the x-ray picture in an oblique position, so that the shadow of the vertical bodies is thrown in front of that of the spinal arches. In cervical and lumbar injuries a lateral view can be taken. It requires the eye of faith to detect a depressed fracture of the laminae in an antero-posterior view of the spine.

No results are more satisfactory than those following a successful laminectomy for the removal of pressure upon the cord, but the indiscriminate exploration of these injuries is calculated to bring this operation into undeserved disrepute.

Lesions of the Cauda Equina

Here operation should not be delayed. It is not yet definitely determined whether regeneration can occur in the nerve roots, but I know of one case in which a regeneration neuroma was found upon the central end of a divided root. This supports the belief that, where possible, the roots should be sutured as soon as possible.

Care of the Bladder in Spinal Lesions

Gaskell and Langley have proved that the bladder receives a double nerve supply from the hypogastric nerves (from the thoraco-lumbar autonomic system) and the pelvic nerves (from the sacral outflow). Both nerves contain afferent and efferent fibres. The preganglionic fibres of the thoraco-lumbar supply to the bladder form synapses around ganglionic cells in the inferior mesenteric ganglia. The ganglion cells of the sacral outflow are actually in the wall of the bladder in the hypogastric plexus.

These two nerve supplies are functionally antagonistic to each other. The pelvic nerves carry impulses causing contraction of the detrusor mechanism and inhibition of the sphincter mechanism of the bladder. The hypogastric nerves, on the other hand, initiate and maintain a contraction of the sphincter musculature and, in some animals, inhibition of the detrusor musculature. The latter action probably does not occur in man.

There are three centres controlling this nerve supply. These are situated in the peripheral ganglia, the spinal cord and the cerebrum. The central nervous system integrates afferent and efferent impulses from the bladder and maintains the static tone of the organ. The wall of the bladder is thus held in a state of constant postural contraction, gripping its contents lightly, whether the amount be large or small. When the cubical content of the bladder reaches a certain amount, reflex emptying takes place. Rythmical contractions of the detrusor musculature increase in amplitude with increasing distension. Afferent impulses are thereby increased and lead to a discharge of pressor impulses by the pelvic nerves to the muscle of the bladder wall and inhibitor impulses to the sphincter musculature, thus emptying the bladder.

In cord lesions two distinct stages are observed:

Stage I. Complete retention: There is active contraction of the bladder sphincter. Feeble contractions of the detrusor musculature occur, but are insufficient to overcome the sphincteric resistance. When the bladder becomes very distended, overflow incontinence results, small amounts of urine dribbling constantly from the meatus.

Stage II. Reflex micturition: In this stage the bladder empties reflexly when its contents reach a certain set capacity. This is the permanent state in severe cord injury. If cystitis be present, the bladder contracts very much and may have a capacity as low as 30 to 60 cu. There is a transition period

between these two stages during which contraction of the detrusor mechanism can expel a small portion of the bladder content.

The condition of flaccidity of the bladder and sphincter, resulting in paralytic incontinence, was not present in any of the cases. This condition was present in and characteristic of a lesion of the lumbar cord or cauda equina.

The problem that concerns us is how to prevent urinary infection during the first stage before the commencement of reflex micturition, i. e., to give the patient a clean automatic bladder.

The first essential is to prevent distension of the bladder. It has been found experimentally in animals that if the bladder distension is not relieved, hemorrhage and ulceration occur in the bladder wall. Distension of the bladder also delays the onset of reflex emptying and may give rise to atony or cystitis and fibrosis.

Four methods of treatment are advised: (1) Catheterization; (2) The tied-in catheter; (3) Manual expression; (4) Supra-pubic cystotomy (a) primary, (b) secondary.

Operative Technique

The author directs special attention to the value of local anesthesia in the operation of laminectomy.

The best method of opening the spinal canal is to make a burr opening through the apex of the spinal arch after removal of the spinous process and to enlarge this opening with a small parrot-bill rongeur. In this way it is easy to avoid any additional injury to the cord; and the time spent in removing the laminae is reduced to a minimum.—*J. E. M. Thomson, Lincoln.*

Concerning the Question of Acute Atrophy of Bone in Fractures. R. Lenk. *Fortschritte aus d. Geb. der Roentgenstrahlen.* Band XXVI. 1919, Heft 4/5.

In a very lengthy discussion concerning acute bone atrophy in fractures of bone, the author arrives at the following conclusions:

1. Acute bone atrophy is a usual occurrence in fractures of bone.

2. Its appearance is noticeable in the radiogram not later than three and a half weeks after the injury.

3. It becomes localised usually, independent of the site of fracture, in all the joints of the injured extremity; in rare cases the atrophy is more pronounced in the joints nearest to the site of fracture.

4. Inactivity is the greatest factor in its production; only in rare instances may other causes be contributing.

5. The acute bone atrophy is not the cause for delay in callus formation.

6. Its prevention can only be attained by the avoidance of inactivity and early mobilisation.—*A. Gottlieb, San Francisco, Calif.*

INFECTIONS OF BONES AND JOINTS. F. J. Cotton. *Surg., Gynec., and Obst.*, 1920 254-262.

This paper is a general review of the subject of infections of bones and joints and gives the ideas of the author as to treatment in such conditions.

In the future the not unusual cases of chronic wound sinuses should be rare. Primary wide debridement has little place in civil surgery. There is no advantage in doing more in cases of osteomyelitis than making a wide open exposure. Remove no bone early when there is infection, but insure wide-open drainage, disinfect, and wait for demarcation.

Cotton emphasizes the points that army splints are meant for use in transportation and that even the Thomas splint must be used skilfully. He mentions the frequency with which war wounds flare up when opened because of non-union, even after they have been healed for a long time. The lack of bone salts in cases of non-union may be overcome by a substance such as magnesium. Cotton is now trying the injection of insoluble lime salts in these cases and suggests that, if this treatment fail, urine salts may be of some avail.

There is usually a three day interval between fever and pain and necrosis. If early exploration is made and the pus evacuated, treatment may be continued in the following manner: (1) drain well, (2) wait for demarcation, (3) wait for involucrum, and (4) use Dakin's solution.

The author obtains more satisfactory results with fat transplants with pedicles than with muscle, and uses bone wax, not expecting it to stay permanently but to be extruded gradually.

In fresh cases of infected joints Cotton washes the lesion with 1-15,000 solution of bichloride of mercury and sutures the capsule tight leaving the wound open. In more serious cases the joint should be laid wide open and disinfected with Dakin's solution.—*M. S. Henderson, Rochester, Minn.*